

DT.1.1.2 CESBA STT GENERIC FRAMEWORK

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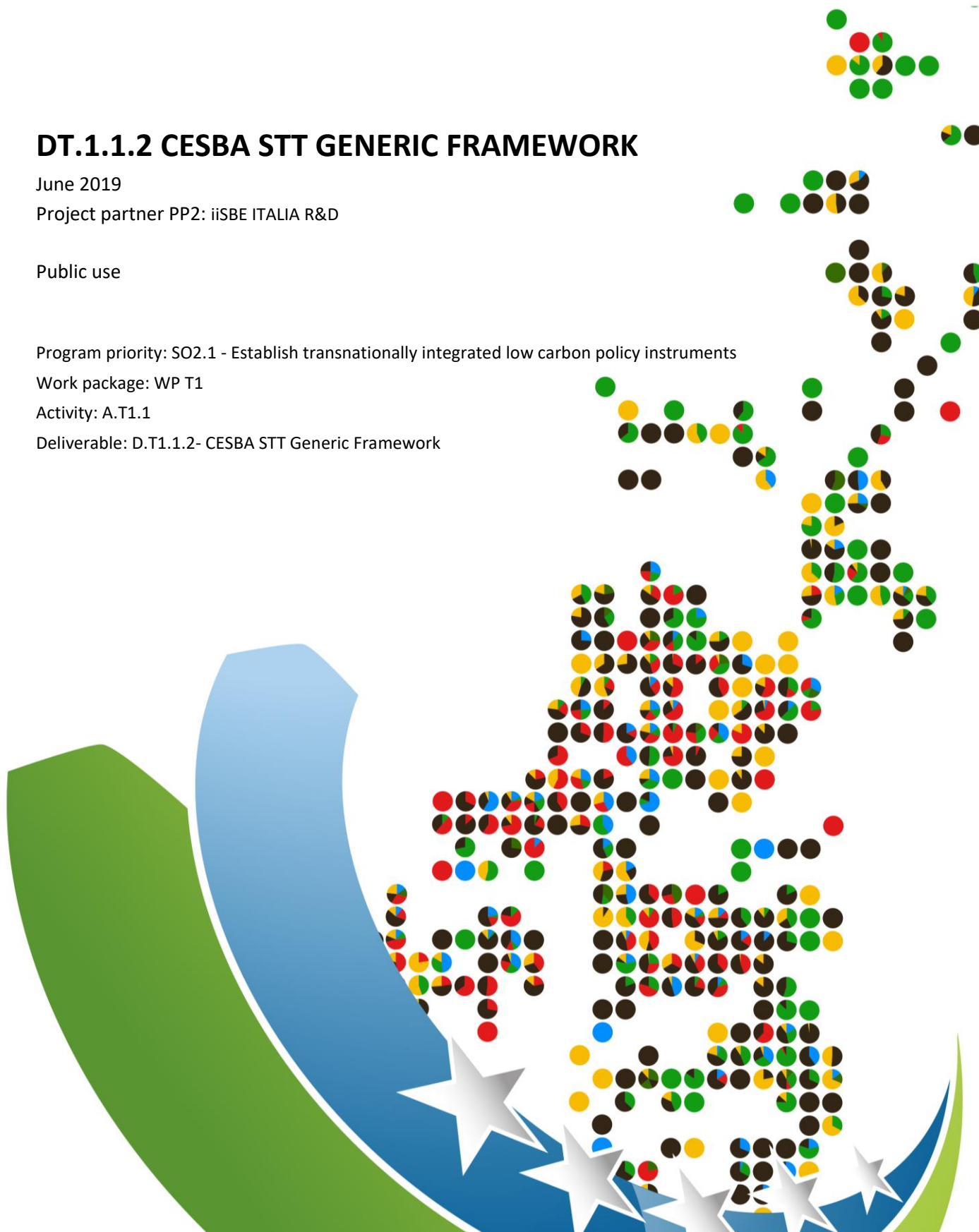
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1 Introduction



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CESBA Sustainable Territories Generic Framework is a tool useful to measure the level of sustainability of a territory. It is a generic multicriteria assessment tool that may be used by third parties to develop rating systems at territorial scale fully contextualized to local conditions.

Originally, the idea of the “Generic Framework” was launched in 1996 by the “Green Building Challenge” international research process. The objective was to develop a transnational common building assessment tool able to generate, through a contextualization process, harmonized national and regional rating system.

The advantage of a generic framework consists in the possibility to transnationally share the same assessment methodology and in the same time to preserve the possibility to adapt the system to local conditions reflecting regional priorities and practices. The generic framework acts as a common transnational language. Having the same meaning, the assessment results are comparable. The use of assessment systems in international policies and initiatives is thus facilitated. In 2000 the Green Building Challenge process was renamed Sustainable Building Challenge and since that time it is coordinated by the no profit organization iiSBE (international initiative for a Sustainable Built Environment).

Through the collaboration of more than 25 countries, representing all the 5 continents, the main result of the SBC has been the SBTool, a generic framework and relative assessment methodology that generated several national and regional assessment systems as Protocollo ITACA (Italy), Verde (Spain), Total Quality (Austria), SBTool CZ (Czech Republic), SBTool PT (Portugal) and inspired the upgrade of several international standard.

The generic framework approach is perfectly in line with the 9 CESBA principles. It is an open source system co-created through a 25 years long process. It is Holistic, taking in account all the sustainability issues. It is fully contextualizable to regional conditions allowing to assign local weights and benchmarks to criteria. It allows the comparability of results at transnational level facilitating the use of a common methodological “language”. It is simple to use and developed for mass certification. For this reason, the SBTool has been chosen by CESBA Alps project as reference methodology.

The most innovative and challenging objective of CESBA Alps has been to define the first generic framework at territorial level (CESBA STT Generic Framework). It means a transnational common and generic multicriteria assessment system that Project Partners will use to develop regional harmonized and compatible assessment tools able to rate the level of sustainability of a territory.

The CESBA STT generic framework is the results of the fruitful and strong cooperation of the CESBA Alps project partners. It is at disposal of any regional or territorial administration in the Alpine Space that intends to develop its own sustainability assessment tool. The use of harmonized regional tools will contribute to the common sustainability targets of Alpine regions and will contribute to the implementation of EUSALP targets.

Turin, June 2017.

2 Generic Framework structure and logic

The CESBA Sustainable Territories Generic Framework (CESBA STT GF) is a transnational generic multicriteria assessment system for rating the sustainability performance of any alpine space territory with a size between 50 Km² and 500 Km².

“Generic” means that the CESBA STT GF needs to be configured to carry out an assessment on a specific territory.

The configuration process consists in the contextualization of the CESBA STT GF to local conditions in the way to reflect the regional sustainability priorities and practices. The contextualization takes place through the selection of the active assessment criteria and the assignment of a weight and a performance scale to them.

Local sustainability priorities are set up assigning a regional weight to the assessment criteria. This aspect is in line with a key CESBA principle: it isn't possible to set transnational weights valid for all regions because the climatic conditions, the sustainability priorities, the social-economic contexts are different.

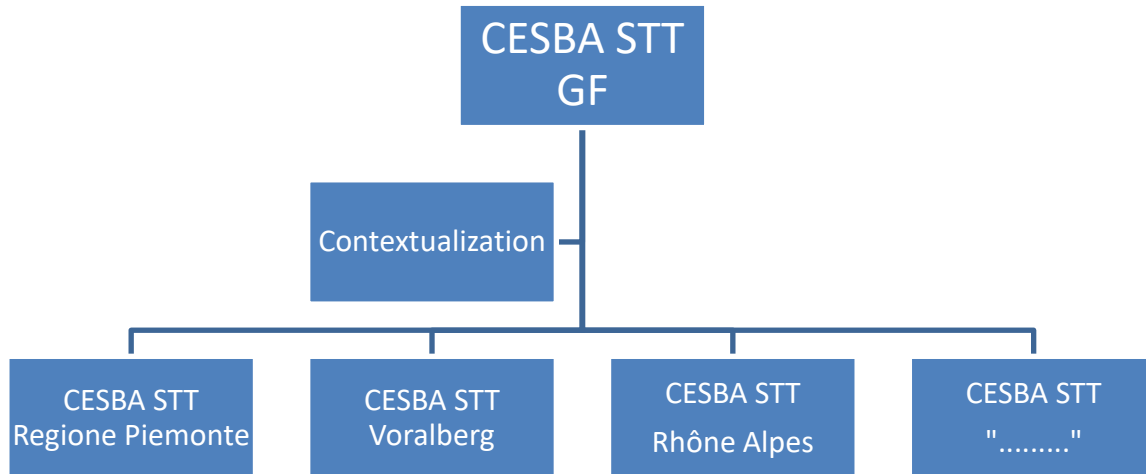
The CESBA STT GF also allows to reflect the local practice, regulations, standards and level of advancement in the sustainability field through the possibility to define for each assessment criterion a local performance scale. Following the CESBA principles, it is not proper to assign a transnational minimum reference performance because the conditions in the alpine regions are different.

Despite the different weights and benchmarks of local systems that are derived from the CESBA STT GF, the results produced by them are fully compatible because based on the same transnational methodology. The results produced have the same meaning: the score represents how much a territory is performing with regards to the minimum local acceptable performance. The transitional comparability of assessment results is guaranteed by the CESBA Alps Passport and the CESBA KPIs.

The use of regional systems based on different methodologies would bring to the same confused situation that today still characterizes the assessment systems at building scale. Only in the European Union there are more than 60 systems in use, all producing scores not comparable. A situation that is still confusing the stakeholders of the building sector.

Through the configuration of the CESBA STT GF, the contextualization process, it is possible to produce local assessment tools for rating the sustainability of any territory in the alpine space. Conventionally, the local systems derived from the CESBA STT GF are named “CESBA STT + Region or territory name” (i.e CESBA STT Regione Piemonte, CESBA STT Val Seriana, etc.). The CESBA STT GF is not operational and can't be used as it is. It needs always to be adapted to local conditions.

The advantage of the Generic Framework principle is that it makes possible to transnationally share the same assessment methodology and approach preserving the possibility to adapt the tool to local conditions. The generic framework is a common transnational language. This aspect is an added value because it facilitates the use of assessment tools in transnational policies and the share of best practices.



2.1 Structure of the CESBA STT GF

The CESBA STT Generic Framework is organized in three modules:

- Information
- Capacity to Act
- Territorial Performance Assessment

The “Information” module provides context related information useful to understand the key characteristics of the territory under assessment. The module is composed by a set of indicators that describe the territory from the point of view of climate, land characteristics, natural risks, demography and renewable energy potential. All these aspects are in general not modifiable and represent an identity card of the territory. The “Information” module doesn’t produce a rating score. The list of indicators included in this module is described in Chapter 4.

The “Capacity to Act” module allows to measure and to score the effectiveness and quality of local policies in terms of participation and governance. It contains 28 criteria. Each of them is associated to an indicator, quantitative or qualitative, that allows to measure the performance reached by the territory. The assessment methodology of the multicriteria tool is described in Chapter 3. Complementary to the indicators of the “Capacity to Act” module is the SHARK methodology that is based on an interview based approach and it is targeted to communities. SHARK is described in Chapter 7

The “Territorial Performance Assessment” (TPA) module allows to measure the performance reached by a territory with regards to 5 main issues and to give a rating to it. The 5 issues are: Territories and Environment, Energy and Resources, Infrastructures and Services, Society, Economy. The module contains more than 300 assessment criteria and relative indicators organized in 35 categories. All criteria measure an objective performance on the base of a specific assessment

method. The TPA module basically measures “physical” quantities. This module hasn’t a prescriptive nature but instead it allows to measure the actual sustainability of a territory and its potential future performance on the base of possible scenarios. For this reason, the TPA module is very useful to support decision making processes at territorial level. Its application can make a public authority aware about the actual level of sustainability of the territory and it can support a decision-making process targeted to identify the best strategies to improve its quality. The assessment methodology is the same one of the “Capacity to Act” module and it is described in Chapter 3. The list of criteria of the Territorial Performance Assessment module is described in Chapter 6.

Information	Capacity to Act	Territorial Performance Assessment
<ul style="list-style-type: none"> •Context related informations •Dosen't produce a score 	<ul style="list-style-type: none"> •Measures the capacity to act of a territorial public administration •Assess the quality of governance and participation of inhabitants •Produces a performance score and gives a rating to the territory •It uses quantitative and qualitative indicators 	<ul style="list-style-type: none"> •Masures the level of sustainability of the territory •Produces scores at level of criteria, categories and issues •Gives a rating to the territory •It is based on quantitative indicators

Modules of the CESBA STT GF

From the CESBA STT Generic Framework it is possible to derive harmonized local assessment tools through a contextualization process articulated in 3 steps:

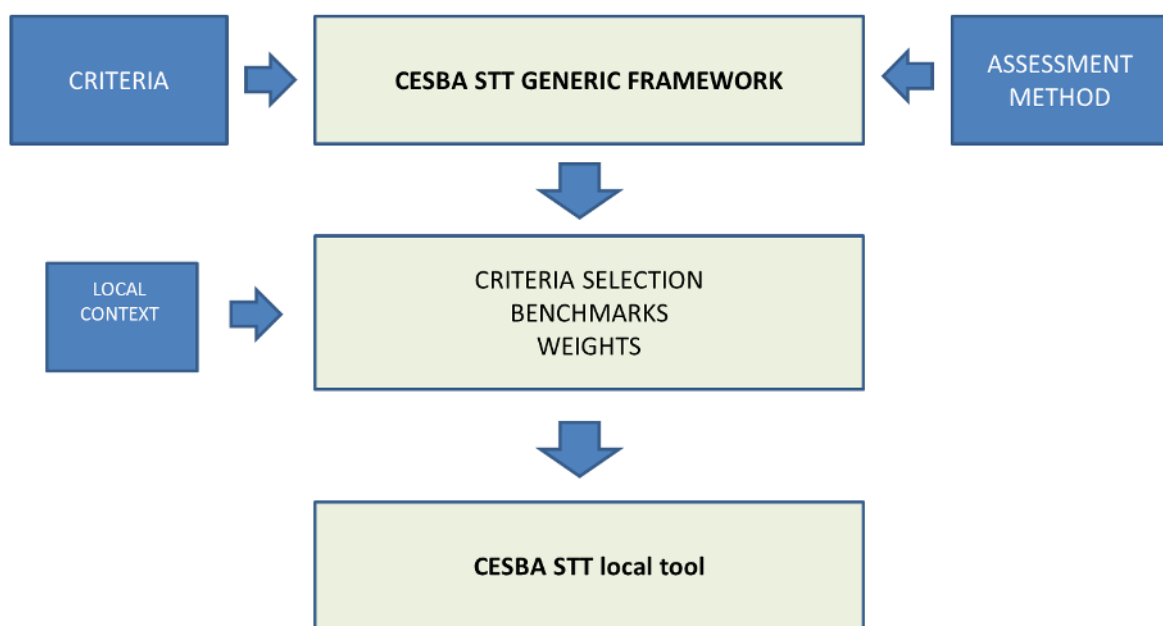
- Selection of the active criteria
- Benchmarking
- Weighting

The first step consists in the selection of the criteria that will be used to carry out the assessment. The criteria are selected from the whole list of the “Capacity to act” and “Territorial Performance Assessment” modules. Each regional authority or third party can freely select the active criteria on the base of its needs and objectives. There isn’t a minimum number of criteria to be selected. The local systems can widely vary from this point of view. Only a core set of criteria, the Key Performance Indicators, are mandatory for all local CESBA STT. The KPIs represent the priority sustainability transnational issues and they allow to compare the key territorial performances in the alpine space through the CESBA Passport. The CESBA KPIs are described in the Deliverable T1.2.1, the Passport in the Deliverable T1.2.2.

The second step, benchmarking, consists in the definition of the scoring scale for each selected criterion. The benchmark is a quantification of the indicator’s value corresponding to the minimum acceptable performance and the one that is considered the best at regional level. Benchmarks can’t be the same at transnational level because the local conditions of each region are different (climate, building practice, standards, level of advancement in the sustainability field, etc..). The scoring scale used in the CESBA STT GF ranges from -1 to 5. Where zero represent the minimum acceptable performance, 5 the excellence, 3 the best practice and -1 a negative performance.

The final step, weighting, consists in the assignment of a weight to each criterion, category and issue. The weight is expressed as a percentage. This process allows to align the assessment tool to local environmental, social and economic priorities. These ones are not the same in all alpine space regions. The contextualisation process take place through the use of a software that corresponds with the Deliverable T1.4.1 and T1.4.2.

Through the CESBA STT Generic Framework all regions in the alpine space can share common assessment methodologies, criteria and indicators. It means to speak the same language. The results of all local assessments will have the same meaning. This aspect will facilitate the transnational cooperation. In the same time, the assignment of local benchmarks and weight allows to reflect the local conditions.



Contextualization process of the CESBA STT Generic Framework

3 CESBA Alps Assessment Methodology

The assessment method adopted in the CESBA STT Generic Framework multicriteria system is the “SBEMethod” (Sustainable Built Environment Method) developed by iiSBE (international initiative for a Sustainable Built Environment). In general, the SBEMethod is a generic multi-criteria analysis methodology for assessing the sustainability of the built environment. Starting from a set of criteria the SBEMethod provides a final score about a building, urban area or territory overall performance.

This assessment methodology is used in the modules “Capacity to Act” and “Territorial Performance Assessment” of the CESBA STT GF. Using this methodology it is possible to give a sustainability rating to a territory.

The sustainability score of the territory under assessment is computed through a mathematical procedure (called assessment procedure) which is articulated in 3 main steps:

- characterization: territory’s performances are quantified through indicators in regard of each criterion;
- normalization: indicator values are adimensionalized and rescaled in a suitable interval, called normalization interval. The normalization consists in the assignment of a score to the indicator’s value.;
- aggregation: normalized scores are combined through weighted sums to produce the final concise score.

The main elements of the SBEMethod can be summarized as follows:

1. a set of criteria;
2. a set of indicators, which allow to quantify the territory’s performances with respect to each criterion;
3. a normalization method (scoring system);
4. an aggregation method;
5. a panel of experts who establish and define criteria and indicators. In CESBA Alps, the CESBA Local Committees act as panel of experts.

3.1 Basic definitions and structure of the SBEMethod

The *SBEMethod* is organized in issues, categories and criteria:

- **Issues:** describe general themes, recognized as relevant for assessing the sustainability of a territory. For instance, the issues of the TPA module are 5: Territories and Environment, Energy and Resources, Infrastructures and Services, Society, Economy. The Capacity to Act module includes only one issue: Participation and Governance
- **Categories:** concern particular aspects of issues. For instance, the issue “Energy and Resources” contains 4 categories: Energy consumptions, Sustainable Energy, Water consumption, Land and building stock use.
- **Criteria:** detail specific aspects of categories. They represent the basic assessment entries used to characterize each territory since the very beginning of the assessment process. For instance, the category “Water consumption” includes 3 criteria: Consumption of water- Human uses, Consumption of water for Agriculture, Winter sports water consumptions.

Issues, categories and criteria are linked in the following sense: each issue includes a variable number of categories (depending from issue to issue), each of them describes a particular aspect of the issue whom it belongs to. The total number of categories in the TPA module is 35, divided in the 5 issues: Territories and Environment (13), Energy and Resources (4), Infrastructures and Services (7), Society (5), Economy (6). Categories include different *criteria*, each of them describing a particular aspect of the corresponding category. The total number of criteria in the TPA module is 312.

The Capacity to Act module includes one issue, one category and 28 criteria.

Some examples of issues, related categories and criteria from the TPA module are reported below:

- Issue: ‘Energy/Resources Consumption’, category: ‘Energy Consumptions’, criterion: ‘Final Energy Consumptions’.
- Issue: ‘Territories and Environment’, category: ‘Land’, criterion: ‘Forest Area’.
- Issue: ‘Society’, category: ‘Socio Economic Aspects’, criterion: ‘Education’.

Each criterion is combined with a (some) physical quantity(ies). These allow to quantify territory’s performances with regard to each criterion. In the SBEMethod, such quantities are called ‘indicators’. An indicator is a methodology which allows to characterize (not necessarily in numerical terms) the territory’s performance with respect to the corresponding criterion.

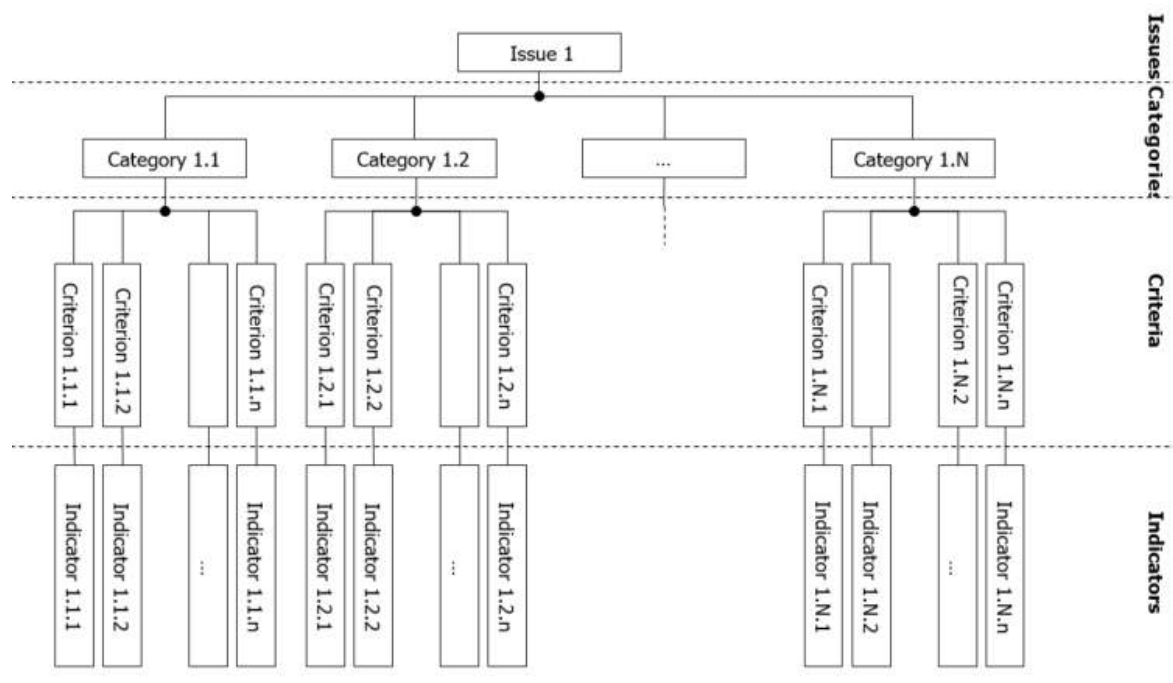
In the SBEMethod, qualitative criteria are also present, for which the territory’s performance is provided in terms of a comparison with a certain number of reference scenarios defined within the corresponding indicator.

Some examples of indicators and corresponding criteria from the TPA module are listed below:

- Criterion: Final energy consumptions – Indicator: Energy consumed per inhabitant – Unit of measure: KTEP/inhabitant
- Criterion: Forest area – Indicator: ratio between forested areas and the geographical area considered – Unit of measure:%
- Criterion: Education – indicator: share of population with at least secondary education – Unit of measure: %

Note that, in principle, several indicators can be associated with the same criterion, as one can define multiple strategies to quantify the territory’s performance in regard to a specific criterion.

In the SBEMethod each criterion is generally associated with a single indicator.



Schematic representation of a generic Issue’s structure in the SBEMethod

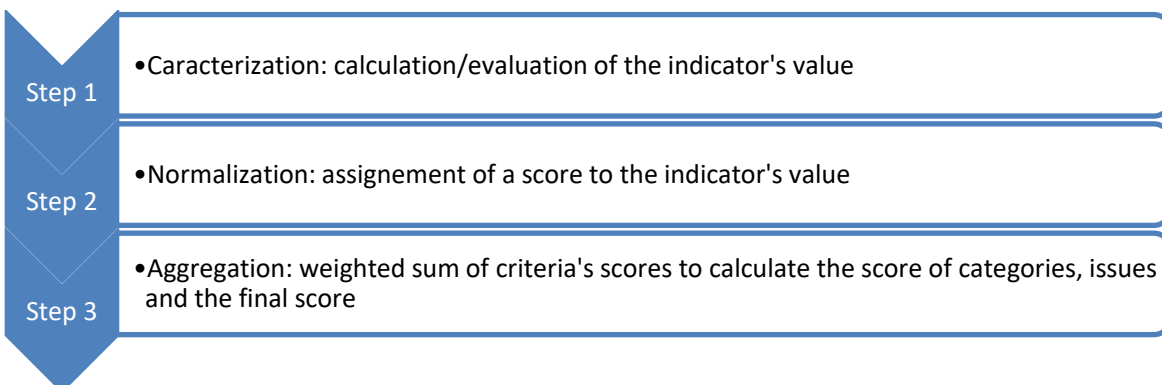
ISSUES

A TERRITORIES AND ENVIRONMENT	B ENERGY AND RESOURCES	C INFRASTRUCTURES AND SERVICES	D SOCIETY	E ECONOMY
CATEGORIES				
A1.Land A2.Water Quality A3.Nature and Biodiversity A4.Landscape A5.Waste A6.Effluents A7.Contaminated land A8.Emissions A9.Quality of air A10.Exposure to non ionising radiation A11.Exposure to ionising radiation A12.Exposure to noise A13.Industrial azards	B1.Energy Consumption B2.Sustainable Energy B3.Water Consumption B4.Land and Building Stock Use	C1.Mobility C2.Leisure services C3.Health services C4.Education C5.Efficiency and Security of Infrastructures C6.Information and Communication C7. Basis - Infrastructure	D1.Demography D2.Socio-Economic Aspects D3.Cultural Aspects D4.Land Use D5.Antropogenetic Risks	E1.Local Economy E2.Actions for innovations E3.Tourism E4.Agriculture E5.Industry E6.Trade commerce

Structure of the Territorial Performance Assessment module: Issues and Categories

3.2 The assessment procedure in the SBEMethod

The main goal of the SBEMethod is to provide a final concise score, which summarizes the overall performance of the territory with respect to all criteria. Such a score is called 'final score', and is computed starting from indicator values. The mathematical procedure used to compute the final score is called assessment procedure, and is articulated in three main steps:

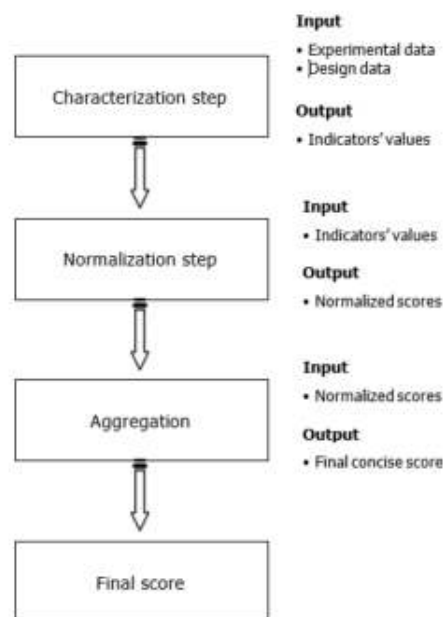


Characterization step. Territory’s performances on each criterion are characterized either by means of a numerical value (if the corresponding indicator represents some physical quantity), or by means of a comparison with some reference scenarios defined by the associated indicator (in the case of qualitative criteria). The output of the characterization step is composed by a set of numerical values (the indicators’ values), each of them representing the territory’s performances in regard to each criterion. The numerical value could for instance correspond to an energy consumption (i.e. kWh/inhabitant).

Normalization step Indicators’ values are adimensionalized and rescaled in a suitable interval called *normalization interval*. The output of the normalization step is represented by a set of normalized scores, each of them is associated with a criterion. The normalization interval used in CESBA STT GF is from -1 to +5. The mining of scores is:

Score	Meaning
-1	The score corresponds to a value of the indicator that is under the minimum acceptable performance.
0	The score corresponds to a value of the indicator that represents the minimum acceptable performance. It is usually defined on the base of regulations and standards.
1	The score corresponds to a value of the indicator that represents a minimum increase of performance with regards to the minimum acceptable performance.
2	The score corresponds to a value of the indicator that represents a substantial increase of performance with to the minimum acceptable performance.
3	The score corresponds to a value of the indicator that represents a best practice.
4	The score corresponds to a value of the indicator that represents an improvement towards the best practice level.
5	The score corresponds to a value of the indicator that represents an excellent and ideal performance.

Aggregation step Normalized scores are combined together (or *aggregated*) in order to compute the overall performance score. The aggregation step consists if a series of weighted sum.



Input / Outputs of the SBEMethod assessment process.

To describe the assessment method in mathematical terms, in the following, these symbols will be used to denote:

- A_i , the i -th issue, $i = 1, \dots, N_A$, and N_A is the total number of issues included in the SBEMethod. E.g: the third issue will be denoted with the symbol A_3 .
- $C_{i,j}$, the j -th category in A_i , $j = 1, \dots, N_C^{(i)}$, where $N_C^{(i)}$ is the number of categories included in the i -th issue. E.g: if the third issue contains 5 categories, $N_C^{(3)} = 5$, and the second category is denoted with the symbol $C_{3,2}$.
- $c_{i,j,k}$, the k -th criterion in the j -th category of the i -th issue, $k = 1, \dots, N_C^{(i,j)}$, and $N_C^{(i,j)}$ is the number of criteria included in $C_{i,j}$. E.g: if the second category includes 7 criteria, $N_C^{(3,2)} = 7$, and the fifth criterion in $C_{3,2}$ is denoted with $c_{3,2,5}$.
- $I_{i,j,k}$, the indicator associated with $c_{i,j,k}$, $k = 1, \dots, N_C^{(i,j)}$. E.g: the indicator associated with the criterion $c_{3,2,5}$ is denoted with the symbol $I_{3,2,5}$
- $\hat{s}_{i,j,k}$, the numerical values of $I_{i,j,k}$. E.g: the numerical values of the indicator $I_{3,2,5}$ associated with $c_{3,2,5}$ is denoted with $\hat{s}_{3,2,5}$

Note: the symbols above indicated are valid for the mathematical description of the multicriteria assessment system. To improve the understandability of the generic framework, in CESBA ALPS STT GF the issues are indicated with a letter in substitution of the number, where 1=A, 2=B, 3=C, 4=D, 5=E. The consequence is that categories are identified by a letter and a number (i.e. A1, C2, D4) and criteria by a letter and two numbers (i.e. A1.3, C2.4, D4.5).

3.2.1 Characterization step

The first step of the analysis is the characterization step. Characterization is performed by assigning a numerical value to each indicator. Such values are determined starting from design data, experimental measures, and through comparison with reference scenarios (in the case of qualitative criteria).

In the CESBA STT F, for each indicator a specific assessment method has been defined to calculate/evaluate its value.

The output of the characterization step is represented by the set of data: $\hat{s}_{i,j,k}$, $k = 1, \dots, N_C^{(i,j)}$, $j = 1, \dots, N_C^{(i)}$, $i = 1, \dots, N_A$, each of them is associated with a criterion, and represents the numerical values of the corresponding indicator.

3.2.2 Normalization step: assignment of a score to indicators' value

The normalization steps consist basically in the assignment of a score to the indicators' value. Due to the diverse nature of criteria, indicator values are characterized by different units of measure and different orders of magnitude. Moreover, indicator values associated with qualitative criteria do not possess any unit of measure as they do not represent any physical quantity. For this reason, indicator values are adimensionalized and rescaled in an interval from -1 to +5 before the aggregation phase.

The normalization method fulfills two basic requirements:

1. indicator values are normalized in the interval [-1, +5], where -1 and +5 are integers, called 'normalization interval'
2. the better the performance, the higher the normalized score.

Normalized scores are computed by applying suitable functions, called '*normalization functions*' to indicator values. These modify indicator values and provide normalized scores which fulfill both the previous requirements.

In the following, these symbols will be used to denote:

- $\phi_{i,j,k}$, the normalization function associated with the indicator $I_{i,j,k}$;
- $s_{i,j,k}$, the normalized score associated with the criterion $c_{i,j,k}$.

Each normalization function is defined in different ways depending on the criterion which it is associated with. In the *SBEMethod* three main kinds of criteria can be distinguished:

- H.I.B. criteria (*Higher is Better*);
- L.I.B. criteria (*Lower is Better*);
- Qualitative criteria.

H.I.B. Criteria (*Higher Is Better*). All criteria such that the higher the numerical value of the corresponding indicator, the higher the performance level. Since the normalized score must fulfil the requirement “the better the performance, the higher the normalized score”, *normalization functions associated with H.I.B. criteria must be increasing functions.*

L.I.B. Criteria (*Lower Is Better*). All criteria such that the lower the numerical value of the corresponding indicator, the higher the performance level. *Normalization functions associated with L.I.B. criteria must be decreasing functions.*

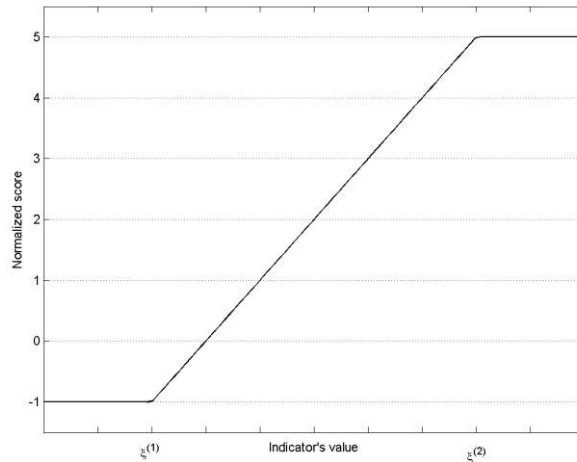
Qualitative criteria. All criteria such that the normalized score can only attain discrete values in the normalization interval, each of them corresponding to a reference scenario defined by the corresponding indicator. Roughly speaking, the normalized score is computed by comparing the territory’s performance with some reference scenarios which are defined by the indicator associated with the criterion.

3.2.2.1 Normalization functions for H.I.B. criteria

In the *SBEMethod*, normalization functions for H.I.B. criteria are piecewise linear functions defined as follows:

$$\phi_{i,j,k}(\hat{s}_{i,j,k}) = \begin{cases} n, & \hat{s}_{i,j,k} \leq \xi_{i,j,k}^{(1)} \\ n + (m - n) \frac{\hat{s}_{i,j,k} - \xi_{i,j,k}^{(1)}}{\xi_{i,j,k}^{(2)} - \xi_{i,j,k}^{(1)}}, & \xi_{i,j,k}^{(1)} < \hat{s}_{i,j,k} \leq \xi_{i,j,k}^{(2)} \\ m, & \hat{s}_{i,j,k} > \xi_{i,j,k}^{(2)} \end{cases} \quad (1)$$

Normalization function of this kind are such that:



Normalization function for a H.I.B. criterion for the case $n = -1$ and $m = 5$

- the normalized score is ' n ', if the indicator value lies below the threshold $\xi_{i,j,k}^{(1)}$;
- the normalized score is ' m ', if the indicator value lies above the threshold $\xi_{i,j,k}^{(2)}$;
- otherwise the normalized score linearly varies in the interval $[\xi_{i,j,k}^{(1)}, \xi_{i,j,k}^{(2)}]$.

Remark: Note that the normalization function defined in (1) for a general H.I.B criterion is an increasing function.

The normalization function depends on two parameters: $\xi_{i,j,k}^{(1)}$ and $\xi_{i,j,k}^{(2)}$ which vary from criterion to criterion. Such parameters are called benchmarks in the sense that they respectively represent the threshold for the worst (-1) and the best (+5) performance.

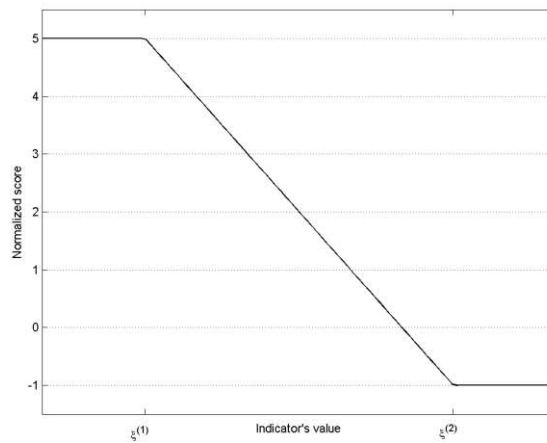
If the numerical values of benchmarks are not available, they are computed starting from some reference values, i.e. two normalized scores (y' and y'') are associated with two values (x' and x'') of the corresponding indicator, and benchmarks are recovered by linear extrapolation:

$$\begin{cases} \frac{\xi_{i,j,k}^{(1)} - x'}{x'' - x'} = \frac{n - y'}{y'' - y'} \\ \frac{\xi_{i,j,k}^{(2)} - x'}{x'' - x'} = \frac{m - y'}{y'' - y'} \end{cases} \quad (2)$$

3.2.2.2 Normalization functions for L.I.B. criteria

The same analysis of the previous section can be repeated in the case of normalization function associated with L.I.B. criteria, with the only exception that in this case, the normalization function must be a decreasing function.

$$\phi_{i,j,k}(\hat{s}_{i,j,k}) = \begin{cases} m, & \hat{s}_{i,j,k} \leq \xi_{i,j,k}^{(1)} \\ m - (m - n) \frac{\hat{s}_{i,j,k} - \xi_{i,j,k}^{(1)}}{\xi_{i,j,k}^{(2)} - \xi_{i,j,k}^{(1)}}, & \xi_{i,j,k}^{(1)} < \hat{s}_{i,j,k} \leq \xi_{i,j,k}^{(2)} \\ n, & \hat{s}_{i,j,k} > \xi_{i,j,k}^{(2)} \end{cases} \quad (3)$$



Normalization function for a L.I.B. criterion in the case $n = -1$ and $m = 5$

Normalization functions of this kind are such that:

- the normalized score is 'm', if the indicator value lies below the threshold $\xi_{i,j,k}^{(1)}$;
- the normalized score is 'n', if the indicator value lies above the threshold $\xi_{i,j,k}^{(2)}$;
- otherwise, the normalized score linearly varies in the interval $[\xi_{i,j,k}^{(1)}, \xi_{i,j,k}^{(2)}]$.

Remark 2 Note that the normalization function defined in (3) is a decreasing function.

The normalization function depends on two parameters: $\xi_{i,j,k}^{(1)}$ and $\xi_{i,j,k}^{(2)}$ which vary from criterion to criterion. Such parameters are called benchmarks in the sense that they respectively represent the threshold for the best (+5) and worst performance (-1).

Also in the present case, if the benchmarks are not available, they are computed by linear extrapolation:

$$\begin{cases} \frac{\xi_{i,j,k}^{(1)} - x'}{x'' - x'} = \frac{m - y'}{y'' - y'} \\ \frac{\xi_{i,j,k}^{(2)} - x'}{x'' - x'} = \frac{n - y'}{y'' - y'} \end{cases} \quad (4)$$

3.2.2.3 Normalization functions for qualitative criteria.

Normalization functions associated with qualitative criteria are defined as follows:

$$\phi(\hat{s}_{i,j,k}) = \begin{cases} s_0, & x = \xi_{i,j,k}^{(0)} \\ s_1, & x = \xi_{i,j,k}^{(1)} \\ s_2, & x = \xi_{i,j,k}^{(2)} \\ \dots, & \\ s_n, & x = \xi_{i,j,k}^{(n)} \end{cases} \quad (5)$$

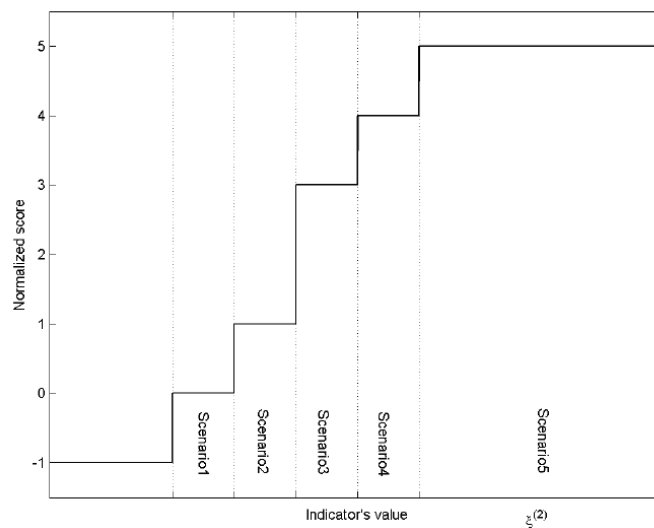
$s_0, s_1, \dots, s_n \in [n, m]$

the normalized score can only attain discrete values in the normalization interval, each of them associated with a reference *scenario* (see, fig. 5).

After $n + 1$ scenarios are defined:

- the normalized score s_0 is associated with the 0-th scenario;
- the normalized score s_1 is associated with the 1-st scenario;
- ...
- the normalized score s_n is associated with the n -th scenario;

Then the territory's performance is compared with all reference scenarios and the normalized score is assigned depending on the result of such a comparison.



Example of a normalization function for a qualitative criterion in the case $n = -1, m = 5$

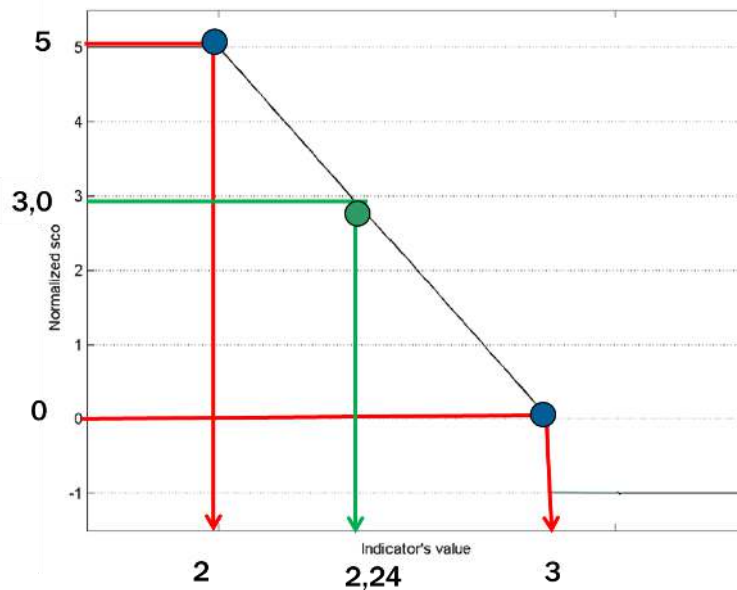
Once all scenarios are defined, normalization functions associated with qualitative criteria only depend on $n + 1$ tunable parameters, which are the normalized score associated with each scenario (s_0, \dots, s_n).

Example:

Criterion “Final energy consumption”

Normalization of the indicator’s value:

- Consumption of energy per inhabitant = 2,24 TEP/inhabitant



Blue dots: represents the minimum acceptable performance (score zero) and the excellent performance (score +5)

Green dot: represents the value of the indicator on the linear performance scale

The results of the normalization for a value of the indicator of 2.24 TEP/inhabitant is a score of 3,0.

3.2.3 Aggregation step

At the end of the normalization step, a new set of data is available, composed of the normalized scores associated with each criterion. Normalized scores are then combined through a series of weighted sums to produce the final score, and this is done in three steps:

- *Aggregation through criteria:* normalized scores associated with all criteria in the same category are aggregated to produce a single score for each category.
- *Aggregation through categories:* normalized score associated with categories in the same issue (these resulting from aggregation through criteria) are further aggregated to produce a single score for each issue.
- *Aggregation through issues:* normalized scores associated with issues (these resulting from aggregation through categories) are aggregated to produce the final concise score.

3.2.3.1 Aggregation through criteria: score of categories

The main goal of aggregation through criteria is to provide a single normalized score for each category. This is computed for each category aggregating the normalized score of all criteria included in that category.

Aggregation is performed by linear aggregation of data through some coefficients, called *weighting factors*. These quantify the relative weight of each criterion with respect to all criteria in the same category.

In the following, these symbols will be used to denote:

- $\omega_{i,j,k}$: the weighting factor associated with the criterion $c_{i,j,k}$ in the category $C_{i,j}$;
- $S_{i,j}$: the normalized score resulting from aggregation of criteria included in the category $C_{i,j}$.

The score $S_{i,j}$ is computed as follows:

$$S_{i,j} = \sum_{k=1}^{N_c^{(i,j)}} \omega_{i,j,k} S_{i,j,k} \quad (6)$$

Note that the weighting factors defined by fulfill the following properties:

- each weighting factor lies in the interval [0, 1];
- $\sum_{k=1}^{N_c^{(i,j)}} \omega_{i,j,k} = 1$

It follows that (6) can be interpreted as a weighted sum of the performance score obtained by the territory in regard of each criterion, i.e. the performance score computed for a given category represents the territory's average performance with respect to all criteria included in that category.

The result of aggregation through criteria is a set of normalized scores, each of them corresponding to a category.

Example: calculation of the score for the category D1 Demography

Code	Criterion	Score	Weight
D1.1	Employment rate of young people (15-24 years old)	3,1	18%
D1.2	Employment rate (20-64 years old)	2,2	18%
D1.3	Balance of migration (immigration flows) over the last 5 years	1,3	18%
D1.4	Unemployment rate	0,5	18%
D1.5	Emigration	1,4	10%
D1.6	Young people neither in employment nor in education or training	3,0	18%

Calculation of the category's score as weighted sum:

Code	Criterion	Score x Weight	Weighted score
D1.1	Employment rate of young people (15-24 years old)	3,1x0,18 =	0,6
D1.2	Employment rate (20-64 years old)	2,2x0,18 =	0,4
D1.3	Balance of migration (immigration flows) over the last 5 years	1,3x0,18 =	0,2
D1.4	Unemployment rate	0,5x0,18 =	0,1
D1.5	Emigration	1,4x0,10 =	0,1
D1.6	Young people neither in employment nor in education or training	3,0x0,18 =	0,5
		TOTAL	2,0

$$S_{i,j} = \sum_{k=1}^{N_c^{(i,j)}} \omega_{i,j,k} s_{i,j,k}$$

Category score = sum of the weighted scores = 2,0

3.2.3.2 Aggregation through categories

Scores obtained in the previous step are further aggregated to produce a single score for each issue.

In the following, these symbols will be used to denote:

- $w_{i,j}$: the weighting factors for each category included in the issue A_i ;
- S_{ij} : the performance score associated with the A_j .

Aggregation through categories is performed for each issue, combining the performance scores of all categories in that issue as follows:

$$S_i = \sum_{j=1}^{N_c^{(i)}} w_{i,j} S_{i,j} \quad (7)$$

$w_{i,j}$ are the 'categories weighting factors' which quantify the relative weight of each category with respect to the others in the same issue.

Weighting factors for categories are established by a panel of experts, and fulfill the following properties:

1. each weighting factor lies in the interval [0, 1];

2. $\sum_{j=1}^{N_c^{(i)}} w_{i,j} = 1$

Therefore also (7) can be interpreted as a weighted sum, i.e. the final score obtained for each issue represents the average performance of the territory with respect to all categories included in that issue.

Example: calculation of the score for the issue D Society

Code	Category	Score	Weight
D1	Demography	2,0	30%
D2	Socio-Economic Aspects	1,2	20%
D3	Cultural aspects	1,5	30%
D4	Land Use	3,2	10%
D5	Antropogenic risks	2,7	10%

Calculation of the issue's score as weighted sum:

Code	Category	Score x Weight	Weighted score
D1	Demography	2,0 x 0,3 =	0,6
D2	Socio-Economic Aspects	1,2 x 0,2 =	0,2
D3	Cultural aspects	1,5 x 0,3 =	0,5
D4	Land Use	3,2 x 0,1 =	0,3
D5	Antropogenic risks	2,7 x 0,1 =	0,3
		TOTAL	1,9

$$S_i = \sum_{j=1}^{N_c^{(i)}} w_{i,j} S_{i,j}$$

Issue score = sum of the weighted scores = 1,9

3.2.3.3 Aggregation through issues: overall score of the territory

Finally, scores provided by aggregation through categories are further aggregated to produce the final concise score representing the territory overall performance.

The final score is computed as follows:

$$\Sigma = \sum_{i=1}^{N_A} W_i S_i$$

where W_i represent the '*weighting factors for all issues*' and express the relative influence of each issue on the final score. The weighting factor for each issue is established by a panel of experts and fulfills the following properties:

- Each weighting factor lies in the interval [0, 1];

$$\sum_{i=1}^{N_A} W_i = 1$$

Therefore, the final score can also be interpreted as the average performance of the territory with respect to all issues.

Example: calculation of the overall score for a territory

Code	Issue	Score	Weight
A	Territories and Environment	3,1	20%
B	Energy/Resources consumption	0,9	15%
C	Infrastructures/Services	2,3	10%
D	Society	1,9	30%
E	Economy	2,1	30%

Calculation of the issue's score as weighted sum:

Code	Issue	Score x Weight	Weighted score
D1	Demography	3,1 x 0,2 =	0,6
D2	Socio-Economic Aspects	0,9 x 1,5 =	1,4
D3	Cultural aspects	2,3 x 0,1 =	0,2
D4	Land Use	1,9 x 0,3 =	0,6
D5	Antropogenic risks	2,1 x 0,3 =	0,6
		TOTAL	3,4

$$\Sigma = \sum_{i=1}^{N_A} W_i S_i$$

Territorial score = sum of the weighted scores = 3,4

4 Information Module: criteria and indicators

This module provides context related information useful to understand the key characteristics of the territory under assessment. The module is composed by a set of indicators that describe the territory from the point of view of climate, land characteristics, natural risks, demography and renewable energy potential. All these aspects are in general not modifiable and represent an identity card of the territory. The “Information” module doesn’t produce a rating score.

List of informative criteria:

I1	Climate
I1.1	Annual Mean Temperature
I1.2	Winter Mean Temperature
I1.3	Summer Mean Temperature
I1.4	Frost Days
I1.5	Days of extreme cold
I1.6	Days of extreme heat
I1.7	Anomaly of extreme temperatures
I1.8	Heating Degrees Day (HDD)
I1.9	Heat Stress Index (HSI)
I1.10	Wind
I1.11	Foggy days
I1.12	Rainfall Index
I1.13	Meteorological drought
I1.14	Intense rain events
I1.15	Consecutive days without rain
I1.16	Rainfall anomalies
I1.17	Maximum rainfall
I1.18	Snowfall
I1.19	Snow on the ground: days
I1.20	UV Index
I2	Land
I2.1	Average slope
I2.2	Average altitude
I2.3	Geomorphological Aspects
I2.4	Geological and Lithological Aspects
I2.5	Avalanche risk
I2.6	Protected Wetlands
I2.7	Area for agriculture
I2.8	Abandoned areas
I3	Natural risks
I3.1	Areas in landslide
I3.2	Seismic activity
I3.3	Avalanche accidents
I3.4	Floodable areas

14	Demography
14.1	Inhabitant Population
14.2	Birth rate
14.3	Mortality rate (for a thousand inhabitants)
14.4	Inhabitants Density
14.5	Fertility Index
14.6	Oldness Index
14.7	Life expectancy
14.8	Share of people < 15 years old
14.9	Share of people 15 - 60 years old
14.10	Share of people > 60 years old
15	Energy
15.1	Potential of renewable energy

4.1 I1- CLIMATE

I1		CLIMATE	
I.1.1	Annual Mean Temperature		
	Intent:	To adopt adaptation measures to climate change	
	Indicator:	Annual mean temperature	
	Unit of measure:	°C	
	Information sources:	Monitored data, statistic data	
	Assessment method:	Calculation in monitoring procedure of the annual average temperature (°C) of the period considered and the average value of the reference climate period (1991-2010)	
	Territorial Scale:	All	
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/componenti-ambientali/clima_temperatura-media	
I.1.2	Winter Mean Temperature		
	Intent:	To adopt adaptation measures to climate change	
	Indicator:	Winter mean temperature	
	Unit of measure:	°C	
	Information sources:	Monitored data, statistic data	
	Assessment method:	Calculation in monitoring procedure of the winter average temperature (°C) of the period considered and the average value of the reference climate period (1991-2010)	
	Territorial Scale:	All	
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/componenti-ambientali/clima_giorni-di-gelo	
I.1.3	Summer Mean Temperature		
	Intent:	To evaluate local winter climate conditions and climate change trends	
	Indicator:	Summer mean temperature	
	Unit of measure:	°C	
	Information sources:	Monitored data, statistic data	
	Assessment method:	Calculation in monitoring procedure of the summer average temperature (°C) of the period considered and the average value of the reference climate period (1991-2010)	
	Territorial Scale:	All	
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/componenti-ambientali/clima_giorni-di-gelo	

I.1.4	Frost Days	
	Intent:	To adopt adaptation measures to climate change
	Indicator:	Number of days with minimum temperature below 0 ° C (frost days), anomaly compared to the reference period, number of days without thaw
	Unit of measure:	Number/year
	Information sources:	Monitored data, statistic data
	Assessment method:	Measurements in monitoring procedure, use of statistic data. Option 1 Verification of number of frost days/with minimum temperature < 0 °C in a year Option 2 Verification of number of frost days/with minimum temperature < 0 °C in a year compared to the reference period Option 3 Verification of number of days maximum temperature < 0 °C without thaw in a year
	Territorial Scale:	All
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/componenti-ambientali/clima_giorni-di-gelo
I.1.5	Days of extreme cold	
	Intent:	To adopt adaptation measures to climate change
	Indicator:	Number of days with the daily minimum temperature < 90° percentile, anomaly compared to the reference period
	Unit of measure:	Number of extreme cold days/year
	Information sources:	Monitored data, statistic data
	Assessment method:	Measurements in monitoring procedure, use of statistic data Option 1 Verification of number of days with the daily minimum temperature < 90° percentile in a year Option 2 Verification of number of days with the daily minimum temperature < 90° percentile anomaly compared to the reference period
	Territorial Scale:	All
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/componenti-ambientali/clima_giorni-di-freddo-intenso

I.1.6	Days of extreme heat	
	Intent:	To adopt adaptation measures to climate change
	Indicator:	Number of days with the daily maximum temperature > 90° percentile, anomaly compared to the reference period
	Unit of measure:	Number /year
	Information sources:	Monitored data, statistic data
	Assessment method:	Measurements in monitoring procedure, use of statistic data Option 1 Verification of number of days with the daily maximum temperature > 90° percentile in a year Option 2 Verification of number of days with the daily maximum temperature > 90° percentile anomaly compared to the reference period
	Territorial Scale:	All
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/componenti-ambientali/clima_giorni-di-caldo-intenso
I.1.7	Anomaly of extreme temperatures	
	Intent:	To adopt adaptation measures to climate change
	Indicator:	Annual anomaly in extreme temperatures (Tmin), Annual anomaly in extreme temperatures (Tmax)
	Unit of measure:	°C
	Information sources:	Monitored data, statistic data
	Assessment method:	Measurements in monitoring procedure. Use of statistic data. Calculation of Difference between the Tmin (daily average) of the year and the typical annual mean. Calculation of Difference between the Tmax (daily average) of the year and the typical annual mean
	Territorial Scale:	All
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/componenti-ambientali/clima_analisi-delle-temperature-estreme

I.1.8	Heating Degrees Day (HDD)	
	Intent:	To adopt adaptation measures to climate change
	Indicator:	Degree Days
	Unit of measure:	°C
	Information sources:	Monitored data, statistic data
	Assessment method:	Measurements in monitoring procedure of external temperature. Calculation of the mean external temperature. Calculation of the summation of the daily difference between the indoor temperature (20°C) and the mean external temperature for the heating period
	Territorial Scale:	All
	Standards or references:	Italian legal reference: DPR412/93 http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/componenti-ambientali/clima_gradi-giorno-di-riscaldamento
I.1.9	Heat Stress Index (HSI)	
	Intent:	To adopt adaptation measures to climate change
	Indicator:	The estimate of the physiological discomfort of the population due to exposure to weather conditions characterized by temperature and air hygroscopic high levels compared to the reference climatology
	Unit of measure:	Number /year
	Information sources:	Monitored data, statistic data
	Assessment method:	Measurements in monitoring procedure the number of days with HSI>9, use of statistic data Option 1 Verification of the number of days with HSI>9 in a year Option 2 Verification of the number of days with HSI>9 in a year compared to the reference climatology
	Territorial Scale:	All
	Standards or references:	Italian legal reference: Directive of The Prime Minister 27 February 2004, DGR n° 37-15176/2005 http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/componenti-ambientali/clima_heat-stress-index-hsi

I.1.10	Wind	
	Intent:	To adopt adaptation measures to climate change
	Indicator:	The annual average speed values and maximum annual gust of last year and the mean values calculated for the anemometer operating period
	Unit of measure:	m/s
	Information sources:	Measured data
	Assessment method:	Measurements in monitoring procedure of the wind speed value. Calculation of the average speed values. Use of statistic data for the calculation of climatological value. The reference values were calculated by averaging the values of average annual speed and maximum gust daily value of each year
	Territorial Scale:	All
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/componenti-ambientali/clima_velocita-media-e-raffica-annua-del-vento
I.1.11	Foggy days	
	Intent:	To adopt adaptation measures to climate change
	Indicator:	Number of foggy days per year (visibility < 1000 m for 3 consecutives hours)
	Unit of measure:	Number/year
	Information sources:	Measured data
	Assessment method:	Measurements in monitoring procedure. Verification of number of foggy days per year with visibility < 1000 m for 3 consecutives hours
	Territorial Scale:	All
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/componenti-ambientali/clima_giorni-di-nebbia
I.1.12	Rainfall Index	
	Intent:	To adopt adaptation measures to climate change
	Indicator:	Annual mean amount of rainfall
	Unit of measure:	mm
	Information sources:	Measured data
	Assessment method:	Monitoring procedure (standard World Meteorological Organization WMO) Measurement of the volume of water flowed on the basin through the spatial information of rainfall measured with rain gauges
	Territorial Scale:	Large
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/componenti-ambientali/acqua_precipitazioni WMO https://www.wmo.int/pages/index_en.html

I.1.13	Meteorological drought	
	Intent:	To adopt adaptation measures to climate change
	Indicator:	Percentage of the territory that suffered a meteorological drought for more than 3 months in a year
	Unit of measure:	%
	Information sources:	Measured data
	Assessment method:	Measurements in monitoring procedure: verification of the territorial area in drought. Calculation of the percentage as a share of the total area
	Territorial Scale:	Large
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/componenti-ambientali/clima_indice-di-siccita-meteorologica-spi
I.1.14	Intense rain events	
	Intent:	To adopt adaptation measures to climate change
	Indicator:	Number of intense rain events in a year (10 mm / 20 minutes)
	Unit of measure:	Number/year
	Information sources:	Measured data
	Assessment method:	Measurements in monitoring procedure: verification of number of intense rain events in a year (more than 10 mm of rain in 20 minutes)
	Territorial Scale:	All
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/componenti-ambientali/clima_eventi-temporaleschi-intensi
I.1.15	Consecutive days without rain	
	Intent:	To adopt adaptation measures to climate change
	Indicator:	Number of consecutive days without rainfall in a year
	Unit of measure:	Number
	Information sources:	Measured data
	Assessment method:	Measurements in monitoring procedure. Verification of number of consecutive days without rainfall in a year
	Territorial Scale:	Large
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/componenti-ambientali/clima_giorni-consecutivi-senza-pioggia-ccd

I.1.16	Rainfall anomalies	
	Intent:	To adopt adaptation measures to climate change
	Indicator:	Difference between the annual rainfall and the typical statistical rainfall (last 10 years)
	Unit of measure:	mm
	Information sources:	Monitored data, statistic data
	Assessment method:	Measurements in monitoring procedure. Use of statistic data. Verification of the annual rainfall. Verification of the typical statistical rainfall (last 10 years). Calculation of difference between the annual rainfall and the typical statistical rainfall (last 10 years)
	Territorial Scale:	All
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/componenti-ambientali/clima_anomalia-precipitazione-totale
I.1.17	Maximum rainfall	
	Intent:	To adopt adaptation measures to climate change
	Indicator:	Annual Maximum level of rainfall in one hour
	Unit of measure:	mm
	Information sources:	Measured data
	Assessment method:	Measurements in monitoring procedure. Verification of Annual Maximum level of rainfall in one hour.
	Territorial Scale:	all
	Standards or references:	www.arpa.piemonte.gov.it/dati-1
I.1.18	Snowfall	
	Intent:	To adopt adaptation measures to climate change
	Indicator:	HN - Annual Total Snowfall
	Unit of measure:	cm
	Information sources:	Measured data
	Assessment method:	Measurements in monitoring procedure. HN - Annual Total Snowfall (Quantities of snowfall referring to 12 representative snow metric station in the Piedmont Alps. The HN values are calculated as the difference of snow on the ground between consecutive days to ensure temporal and spatial homogeneity of the analysed variables)
	Territorial Scale:	Large
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/componenti-ambientali/clima_precipitazioni-nevose

I.1.19	Snow on the ground: days	
	Intent:	To evaluate local winter climate conditions and climate change trends
	Indicator:	Annual number of days with snow on the ground in relationship with the typical value, increase compared to the reference period. The indicator provides information on the number of days of presence of snow cover, in relation to the seasonal average of the period '81 -'10, of 12 representative snow metric station in the Piedmont Alps
	Unit of measure:	Number, %
	Information sources:	Measured data
	Assessment method:	Option 1 Verification of the number of days with snow on the ground. Option 2 Verification of the number of days with snow on the ground. Calculation of average reference period. Calculation of the percentage of increase in relationship with the reference period
	Territorial Scale:	All
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/componenti-ambientali/clima_giorni-di-permanenza-neve-al-suolo
I.1.20	UV Index	
	Intent:	To minimize the exposition to non ionising radiation
	Indicator:	Global Solar UV Index
	Unit of measure:	UV index
	Information sources:	Measured data
	Assessment method:	The indicator evaluates the intensity of solar UV radiation and its effectiveness in causing erythema. It is a number between 1 and 12
	Territorial Scale:	All
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/pressioni-ambientali/radiazioni-non-ionizzanti_indice-uv-1 WHO. Global solar UV - Index. A practical guide. 2002 http://www.unep.org/PDF/Solar_Index_Guide.pdf ; 2002

4.2 I2- LAND

I2		LAND	
I.2.1	Average slope		
	Intent:	Evaluate the average slope of the territory	
	Indicator:	Slope of the territory	
	Unit of measure:	%	
	Information sources:	Measured data	
	Assessment method:	Calculate the average slope of the territory	
	Territorial Scale:	All	
	Standards or references:	Regione Lombardia, Geoportal	
I.2.2	Average altitude		
	Intent:	Evaluate the average altitude of the territory	
	Indicator:	Altitude of the territory	
	Unit of measure:	Meters above sea level	
	Information sources:	Measured data	
	Assessment method:	Calculate the average altitude of the territory	
	Territorial Scale:	All	
	Standards or references:	Regione Lombardia, Geoportal	
I.2.3	Geomorphological Aspects		
	Intent:	To define the landscape sensitivity according to the geomorphological characteristics of the territory	
	Indicator:	Morphological units (type, main characters)	
	Unit of measure:	n	
	Information sources:	Measured data	
	Assessment method:	Evaluate morphological units of the territory	
	Territorial Scale:	All	
	Standards or references:	State of Environment Report and Environmental Indicators - ARPA Piemonte	
I.2.4	Geological and Lithological Aspects		
	Intent:	To define the dominant matrix of the shaping of the landscape	
	Indicator:	Lithological character	
	Unit of measure:	-	
	Information sources:	Qualitative data	
	Assessment method:	Evaluate lithological character	
	Territorial Scale:	All	
	Standards or references:	State of Environment Report and Environmental Indicators - ARPA Piemonte	

I.2.5	Avalanche risk	
	Intent:	To reduce risks
	Indicator:	Avalanche area
	Unit of measure:	ha
	Information sources:	Studies
	Assessment method:	<p>Mapped avalanches are the product of an integrated study conducted both by photo interpretation and by territory surveys through the investigation area with the support of witnesses and archive data searches (parish, forest, communal, editorial archives).</p> <p>Work is carried out on three integrated levels:</p> <ul style="list-style-type: none"> • Locating the avalanche sites by photo-interpretation of summer aerofotograms; • Execution of extensive land surveys throughout investigated territory and collected oral testimonies; • Integration of land data with historical information. <p>This product is updated by the Nivometeo Center of the ARPA of Bormio (SO).</p>
	Territorial Scale:	All
	Standards or references:	Regione Lombardia, Geoportal, Map Localization Probable Avalanche
I.2.6	Protected Wetlands	
	Intent:	To improve biodiversity
	Indicator:	Distribution of natural and artificial wetlands on the territory
	Unit of measure:	Number
	Information sources:	Measured data
	Assessment method:	<p>Survey of the geographic data at regional and local level</p> <p>The data comes from the reconnaissance, analysis, evaluation and systematization of the available geographic information useful for the project, both at regional and local level</p>
	Territorial Scale:	All
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/componenti-ambientali/natura-e-biodiversita_stato-e-trend-delle-specie-ornitiche
I.2.7	Area for agriculture	
	Intent:	To measure the correlation between space usages
	Indicator:	Percentage of area for agriculture
	Unit of measure:	%
	Information sources:	Measured data
	Assessment method:	Calculate the percentage of area for agriculture
	Territorial Scale:	All
	Standards or references:	Marktbericht Landwirtschaft, maps of the municipalities

I.2.8	Abandoned areas	
	Intent:	To revitalize and reclaim abandoned areas
	Indicator:	Surface of abandoned areas (only for anthropized area)
	Unit of measure:	%
	Information sources:	Measured data
	Assessment method:	Calculate the ratio between the abandoned areas and total geographical area
	Territorial Scale:	All
	Standards or references:	SIMON – Systema Informativo Monitoraggio PGT - Monitoring Informatic System for Territorial Governance Plans of Lombardy Municipalities

4.3 I3- NATURAL RISKS

I3	NATURAL RISKS	
I.3.1	Areas in landslide	
	Intent:	To protect inhabitants from natural risks
	Indicator:	Extension of areas in landslide
	Unit of measure:	km ² ; %
	Information sources:	Data Bank (GIS) provided by Regional and National Institutions
	Assessment method:	Option 1 Calculation of the landslide areas(km ²) Option 2 Calculation of the landslide areas(km ²). Calculation of total mountainous/hilly area (slope >4°). Calculation of the percentage of the areas in landslide respect to the total mountainous/hilly area
	Territorial Scale:	All
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/pressioni-ambientali/rischi-naturali_aree-in-frana ISPRA http://www.progettoiffi.isprambiente.it/cartanetiffi/

I.3.2	Seismic activity	
	Intent:	To protect inhabitants from natural risks
	Indicator:	Number of seismic events
	Unit of measure:	Number
	Information sources:	Measured data
	Assessment method:	Measurements in monitoring procedure by legal framework
	Territorial Scale:	All
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/pressioni-ambientali/rischi-naturali_attivita-sismiche
I.3.3	Avalanche accidents	
	Intent:	To protect inhabitants from natural risks
	Indicator:	Number of avalanche accidents, people caught in the accident, number of victims
	Unit of measure:	Number/year
	Information sources:	Measured data
	Assessment method:	Measurements in monitoring procedure. Option 1 Verification of the number avalanche accidents. Option 2 Verification of the number of people caught in the accident. Option 3 Verification of the number of victims
	Territorial Scale:	Large
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/pressioni-ambientali/rischi-naturali_incidenti-e-vittime-da-valanga
I.3.4	Floodable areas	
	Intent:	To protect inhabitants from natural risks
	Indicator:	The indicator provides information about the areas affected by flooding and alluvionament by the primary and secondary network
	Unit of measure:	km ² ; %
	Information sources:	Monitored data
	Assessment method:	Option 1 Verification of the floodable area (Km ²) Option 2 Verification of the floodable area (Km ²). Calculation of the percentage of the floodable area in relationship to the provincial area .
	Territorial Scale:	All
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/pressioni-ambientali/rischi-naturali_aree-soggette-a-dinamiche-fluviali

4.4 I4- DEMOGRAPHY

I4		DEMOGRAPHY	
I.4.1	Inhabitant Population		
	Intent:	Evaluate the number of people living in a selected territory surface	
	Indicator:	Human density	
	Unit of measure:	n/km2	
	Information sources:	Statistic data	
	Assessment method:	Calculate the ratio between people living in the selected territory and the total municipal area	
	Territorial Scale:	All	
	Standards or references:	ISTAT, Municipal civil registry offices, CSTB - Urban Morphology Laboratory	
I.4.2	Birth rate		
	Intent:	To assess the growth / decline of the population	
	Indicator:	Birth rate per thousand inhabitants	
	Unit of measure:	number/1.000 inhabitants	
	Information sources:	Statistic data on population	
	Assessment method:	Verification of the number of live births in a year in a territory. Verification of the number of inhabitants living in the territory. Calculation of the ratio between number of live births in a year per 1.000 inhabitants	
	Territorial Scale:	All	
	Standards or references:	http://www.ruparpiemonte.it/infostat/filtri.jsp?idReport=MA_TAB_VA	
I.4.3	Mortality rate (for a thousand inhabitants)		
	Intent:	To assess the growth / decline of the population	
	Indicator:	Mortality rate per thousand inhabitants	
	Unit of measure:	number/1.000 inhabitants	
	Information sources:	Statistic data on population (number of deaths per thousand inhabitants)	
	Assessment method:	Verification of the number of inhabitants living in the territory. Calculation of the ratio between number of deaths in a year per 1.000 inhabitants	
	Territorial Scale:	All	
	Standards or references:	http://www.ruparpiemonte.it/infostat/filtri.jsp?idReport=MA_TAB_VA	

I.4.4	Inhabitants Density	
	Intent:	To know the inhabitants density of the territory
	Indicator:	Number of inhabitants per area
	Unit of measure:	number/Km2*year
	Information sources:	Statistic data on population
	Assessment method:	Verification of the number of inhabitants in a year in a territory. Calculation of the ratio between number of inhabitants per area
	Territorial Scale:	All
	Standards or references:	http://www.ruparpiemonte.it/infostat/filtri.jsp?idReport=MA_TAB_VA
I.4.5	Fertility Index	
	Intent:	To know the demographic trend
	Indicator:	Ration between number of live births and women of childbearing age
	Unit of measure:	number/number
	Information sources:	Statistic data on population, MADEsmart
	Assessment method:	Verification of the number of live births in a year in a territory. Verification of the number of women of childbearing age (between 15 and 49 years) living in the territory. Calculation of the ratio between number of live births in a year and the number of women of childbearing age
	Territorial Scale:	All
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/qualita-della-vita/inquadramento-socio-economico_indice-di-fertilita
I.4.6	Oldness Index	
	Intent:	To estimate the aging degree of the population
	Indicator:	Ratio between old (>65) and young (<14) inhabitants
	Unit of measure:	number/number*year
	Information sources:	Statistic data on population, MADEsmart
	Assessment method:	Verification of the number of inhabitant(> 65 years) in a year in a territory. Verification of the number of number of inhabitant (< 14 year) living in the territory. Calculation of the ratio between the number of inhabitant(> 65 years) and the number of number of inhabitant (< 14 year)childbearing age
	Territorial Scale:	All
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/qualita-della-vita/inquadramento-socio-economico_indice-di-vecchiaia

I.4.7	Life expectancy	
	Intent:	To show the health state of the population
	Indicator:	Life expectancy at birth
	Unit of measure:	Number of years
	Information sources:	Statistical data
	Assessment method:	Calculations based on Life tables that show intensity of dying and age distribution. Calculated values are comparable in time and space
	Territorial Scale:	Large
	Standards or references:	Statistical Office of Republic of Slovenia, Eurostat, Statistical Offices
I.4.8	Share of people < 15 years old	
	Intent:	To monitor the share of people in young age
	Indicator:	Percent of people younger than 15 years old
	Unit of measure:	%
	Information sources:	Statistical data
	Assessment method:	Check via statistic office the number of people younger than 15 and relate them to the total number of people in the municipality
	Territorial Scale:	Small / Municipality or part of Municipality
	Standards or references:	Statistic office
I.4.9	Share of people 15 - 60 years old	
	Intent:	To monitor the share of people in the age between 15 and 60 years old
	Indicator:	Percent of people between 15 and 60 years old
	Unit of measure:	%
	Information sources:	Statistical data
	Assessment method:	Check via statistic office the number of people between 15 and 60 years old and relate them to the total number of people in the municipality
	Territorial Scale:	Small / Municipality or part of municipality
	Standards or references:	Statistic office
I.4.10	Share of people > 60 years old	
	Intent:	To monitor the share of people in old age
	Indicator:	Percent of people older than 60 years
	Unit of measure:	%
	Information sources:	Statistical data
	Assessment method:	Check via statistic office the number of people older than 60 years and relate them to the total number of people in the municipality
	Territorial Scale:	Small / Municipality or part of municipality
	Standards or references:	Statistic office

4.5 I5- ENERGY

I5		ENERGY	
I.5.1	Potential of renewable energy		
	Intent:	Ideal utilization of renewable energy sources	
	Indicator:	Renewable energy potentially available and utilisable	
	Unit of measure:	MWh / km ² a	
	Information sources:	Calculated data	
	Assessment method:	Identification of renewable energy sources (accessible, economically reasonable), scenario planning with established energy technology choices	
	Territorial Scale:	All	
	Standards or references:	German renewable potential Atlas: https://unendlich-viel-energie.de/media/file/319.Potenzialatlas_2_Auflage_Online.pdf Wind and Solar-Atlas, Renewable energy potential investigations	

5 Capacity to Act Module: criteria and indicators

The “Capacity to Act” module is useful to evaluate the effectiveness and quality of local policies and processes in terms of participation and governance. It contains 28 criteria. Each of them is associated to an indicator, quantitative or qualitative, that allows to measure the performance reached by the territory.

On the base of indicators’ value, the Capacity to Act module produces performance scores and rating. The assessment method is described in Chapter 3 “CESBA Alps Assessment Methodology”.

P1	Partecipation and governance
P1.1	Integration of energy issues in planning documents
P1.2	Land use policy tools against urban sprawl and urban scattering
P1.3	Public participation processes
P1.4	Social climate
P1.5	Sustainable urban planning
P1.6	Territorial tools to support sustainable construction
P1.7	Territorial policy with clear objectives
P1.8	Sustainable construction assessment system
P1.9	Involvement of local actors in the local governance and activities
P1.10	Monitoring of the satisfaction of buildings users
P1.11	Disaster preparedness
P1.12	Climate change adaption
P1.13	Use of recycled materials
P1.14	Use of eco/local/recycled materials
P1.15	Rate of sustainable development training for the elected Representatives and communities employees
P1.16	Information and communication campaigns for large audience
P1.17	Support to eco/local material value chain
P1.18	Ensuring/securing drinking water sources
P1.19	Compensation and storage of CO2
P1.20	Protection from natural hazards
P1.21	Waste prevention or cascading use
P1.22	Electric vehicles / Infrastructures
P1.23	Organisation of energy networks
P1.24	Public support to local economy
P1.25	Actions of promotion of the social and solidarity economy
P1.26	Energy improvement of the building stock of modest people
P1.27	Ensuring/securing quality of cultural landscape
P1.28	Air quality monitoring stations

5.1 P1- PARTECIPATION AND GOVERNANCE

P1		PARTECIPATION AND GOVERNANCE	
P.1.1	Integration of energy issues in planning documents		
	Intent:	To encourage the integration of energy issues in the legal planning documents	
	Indicator:	Public lighting and urban furniture consumption	
	Unit of measure:	kWh/inhabitant	
	Information sources:	Monitored data from the distribution grid and energy supplier, and general census for the population data (provided by the national institute for statistic INSEE for France)	
	Assessment method:	Energy consumption for public lighting and urban furnitures / total number of inhabitant	
	Territorial Scale:	Small	
	Standards or references:	State Department on energy and housing, Regional scheme for energy efficiency (SRCAE in French) Local energy and climate planning documents (PCET in France equivalent to SEAP - sustainable energy action plan)	
P.1.2	Land use policy tools against urban sprawl and urban scattering		
	Intent:	To preserve natural area and landscape	
	Indicator:	Already built up areas and areas to be urbanised	
	Unit of measure:	ha/inhabitant	
	Information sources:	Local land use master plan and INSEE data from the general census for the population data (provided by the national institute for statistic INSEE for France)	
	Assessment method:	(Already built up areas + areas to be urbanised in planning documents)/total number of inhabitants	
	Territorial Scale:	Small	
	Standards or references:	Studies from the local urban agency of Marseille AGAM	

P.1.3	Public participation processes	
	Intent:	Strengthening public participation/commitment
	Indicator:	Number of people who participate in processes
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	Evaluate, through survey with questions about commitment in associations/clubs, etc., people committing in associations related to the total number of inhabitants
	Territorial Scale:	All
	Standards or references:	Survey about volunteer commitment: http://www.vorarlberg.at/vorarlberg/umwelt_zukunft/zukunft/buerofuerzukunftfragen/weitereinformationen/buergerschaftlichesengage/vorarlbergueberblick/neuestudiezumthema_buerge.htm Questionnaire done by governmental institutions
P.1.4	Social climate	
	Intent:	To show the democratic development and the development of relations in society
	Indicator:	Trust in institutions
	Unit of measure:	%
	Information sources:	Statistical data (based on surveys)
	Assessment method:	Surveying with question about trust for several national and European institutions. Three possible answers - Tend to trust, Tend not to trust, Don't know
	Territorial Scale:	Large
	Standards or references:	Eurobarometer
P.1.5	Sustainable urban planning	
	Intent:	To assess the sustainability of the urban planning and management
	Indicator:	Number of documents of urban planning that include sustainable development aspects in a practical and prospective vision
	Unit of measure:	Number
	Information sources:	Collection of documents
	Assessment method:	List of urban documents existing on a territory. : 1 point for each significant document
	Territorial Scale:	All
	Standards or references:	CCL CESBA ALPS

P.1.6	Territorial tools to support sustainable construction	
	Intent:	To assess the capacity to act of the territory in the field of sustainable construction
	Indicator:	Number of projects using a territorial assistance service dedicated to sustainable construction : Local energy agency, advisory service for municipalities, advisory service for private owners
	Unit of measure:	Number
	Information sources:	Advisory services annual reports
	Assessment method:	Collect and analyse the assistance services annual report. If possible separate private and public buildings.
	Territorial Scale:	Large
	Standards or references:	CLER TEPOS (French network for the energy transition, Working group for positive energy territories)
P.1.7	Territorial policy with clear objectives	
	Intent:	To assess the translation of the political view in policies
	Indicator:	Policies with clear objectives and evaluation monitoring : Energy Positives Territory approach, Sustainable Energy Actions Plans, Local and planning codes
	Unit of measure:	Y/N
	Information sources:	Collection of significant Local policies
	Assessment method:	Evaluate the number of territorial policies, 0 point if no
	Territorial Scale:	Large
	Standards or references:	CLER TEPOS (French network for the energy transition, Working group for positive energy territories)
P.1.8	Sustainable construction assessment system	
	Intent:	To assess the capacity to act of the territory in the field of sustainable construction
	Indicator:	Projects using a sustainable assessment system
	Unit of measure:	%
	Information sources:	Assessment system monitoring and statistics of projects (construction/renovation authorizations)
	Assessment method:	Divide the number of projects in construction phase per year by the number of assessed projects ==> 1 point per percent
	Territorial Scale:	All
	Standards or references:	HQE ² R

P.1.9	Involvement of local actors in the local governance and activities	
	Intent:	To assess the involvement of citizens and SME's to the local life
	Indicator:	Citizens and SME's involved in awareness actions
	Unit of measure:	Number
	Information sources:	Calculated data (list of actions and participants)
	Assessment method:	Calculate the number of citizens and SME's involved in awareness actions (if possible separate the number of participants in public, private and citizen involvement categories)
	Territorial Scale:	All
	Standards or references:	Livre HQE ² R
P.1.10	Monitoring of the satisfaction of buildings users	
	Intent:	To assess the building users satisfaction
	Indicator:	Vacancy in main homes
	Unit of measure:	%
	Information sources:	Local/regional statistics, studies
	Assessment method:	Standardised method to evaluate the vacancy of houses
	Territorial Scale:	All
	Standards or references:	CCL CESBA ALPS
P.1.11	Disaster preparedness	
	Intent:	Ensuring disaster relief knowledge in municipality
	Indicator:	Annual participants of a municipality in a disaster relief training
	Unit of measure:	inhabitants / 1000 inhabitants *a
	Information sources:	Calculated data
	Assessment method:	Evaluate the annual participants of a municipality in a disaster relief training over 1000 inhabitants, using record course participants
	Territorial Scale:	All
	Standards or references:	Government Safety Website, Training program: https://www.vorarlberg.at/vorarlberg/sicherheit_inneres/sicherheit/landeswarnzentrale/weitereinformationen/lwz_landeswarnzentrale/_katastrophenschutz/schulungs-undkursaktivita.htm Training program information, municipality records

P.1.12	Climate change adaption	
	Intent:	To deal with climate change and plan and track measures early enough to protect inhabitants but also to use chances
	Indicator:	Number of measures municipalities track
	Unit of measure:	x measures / 1000 inhabitants
	Information sources:	Calculated data
	Assessment method:	Calculate the number of measures municipalities track through Record tracked measures
	Territorial Scale:	All
	Standards or references:	Government climate change adaption action plan: https://www.vorarlberg.at/vorarlberg/umwelt_zukunft/umwelt/natur-undumweltschutz/weitereinformationen/klimaschutz/aktionsplanklimawandelanp.htm Municipalities climate change adaption track plan
P.1.13	Use of recycled materials	
	Intent:	To assess the efforts made on the territory to promote the use of recycled materials in the building sector
	Indicator:	Number of policies and actions toward sustainable buildings that includes a specific part to promote recycled materials
	Unit of measure:	Number
	Information sources:	Urban codes, buildings assessment tools, call for tenders recommendations
	Assessment method:	List of the policies and actions possible on a territory and their detailed content : 1 point for each policy or territorial action that includes a significant part dedicated to the promotion of recycled material
	Territorial Scale:	All
	Standards or references:	HQE ² R, ISDIS
P.1.14	Use of eco/local/recycled materials	
	Intent:	To assess the efforts made on the territory to promote the use of ecological and local materials in the building sector
	Indicator:	Number of policies and actions towards sustainable buildings that includes a specific part to promote local and ecological materials
	Unit of measure:	Number
	Information sources:	Urban codes, buildings assessment tools, call for tenders recommendations
	Assessment method:	List of the policies and actions possible on a territory and their detailed content : Analyse of the documents searching for significant elements ==> 1 point for each policy or territorial action that includes a promotion of local and ecological materials
	Territorial Scale:	All
	Standards or references:	CCL CESBA ALPS

P.1.15	Rate of sustainable development training for the elected Representatives and communities employees	
	Intent:	To inform and raise awareness of local authorities from representatives to technicians on sustainable development
	Indicator:	Training of local authorities on sustainable development
	Unit of measure:	%
	Information sources:	Human resources services of local authorities, sustainable development services of local authorities, local training institute for local authorities
	Assessment method:	(number of trained agents and elected representatives/total number of agents and representatives)*100
	Territorial Scale:	All
	Standards or references:	Local Energy and Climate Action Plan (PCAET in French equivalent to SEAP - sustainable energy action plan) and Agenda 21
P.1.16	Information and communication campaigns for large audience	
	Intent:	To promote and raise awareness of inhabitants on sustainable development
	Indicator:	Information campaigns
	Unit of measure:	Number of events organised on sustainable development by local authorities and their partners
	Information sources:	Local authorities, partners (local energy agencies...)
	Assessment method:	Sum of all sustainable development related events for the public
	Territorial Scale:	Large
	Standards or references:	Regional scheme for energy (SRCAE) and local energy and climate action plan (PCAET in French equivalent to SEAP - sustainable energy action plan) and Agenda 21
P.1.17	Support to eco/local material value chain	
	Intent:	To assess the promotion of eco/local materials and their value chain
	Indicator:	Actions carried out to increase the value chain of eco/local products
	Unit of measure:	Number
	Information sources:	Calculated data (collection of local actions)
	Assessment method:	List of possible actions. Evaluation of the significance of the actions.==> 1 point per significant action
	Territorial Scale:	Large
	Standards or references:	<u>Verdura</u>

P.1.18	Ensuring/securing drinking water sources	
	Intent:	Sustainable usage/treatment of drinking water sources
	Indicator:	Drinking water sources with a protection zone
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	Calculate the number of drinking water sources with (sufficiently dimensioned) in relation to protection zone
	Territorial Scale:	All
	Standards or references:	Governmental water management: https://www.vorarlberg.at/vorarlberg/wasser_energie/wasser/wasserwirtschaft/weitereinformationen/service/publikationen/fachberichte/wasserwirtschafts-strateg.htm Water management report
P.1.19	Compensation and storage of CO2	
	Intent:	To lower CO2 concentration in the atmosphere
	Indicator:	CO2 compensated or stored by public sector and enterprise alliances through set measures or payment
	Unit of measure:	t CO ² / inhabitant
	Information sources:	Calculated data
	Assessment method:	Calculate the tons of CO2 compensated or stored by public sector and enterprise alliances through set measures or payment related to total number of inhabitants, using standardized CO2 compensation calculation
	Territorial Scale:	Large
	Standards or references:	Governmental funded climate protection organisation: https://www.climateaustria.at/projekte.html Climate protection project record
P.1.20	Protection from natural hazards	
	Intent:	To keep death toll and number of injuries as low as possible in case of natural hazards
	Indicator:	Share of people living in "HQ-territory"
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	Calculate the number of households in natural hazard zones related to flood zone (HQ zone) times the registered people in the household
	Territorial Scale:	All
	Standards or references:	Hazard zone plan: https://www.bmlfuw.gv.at/forst/oesterreich-wald/raumplanung/gefahrenzonenplan.html Natural hazard plan

P.1.21	Waste prevention or cascading use	
	Intent:	To assess how a community performs in terms of waste avoidance and therefor reduces the need of waste treatment facilities / landfills
	Indicator:	Mass of waste per person and year; share of waste used for up-/re-/down-cycling
	Unit of measure:	Kg/year; %
	Information sources:	Statistic data
	Assessment method:	Statistical values of environment division, compare to previous year, evaluate set measures (like prevention/reuse-initiatives, trainings etc), set new measures
	Territorial Scale:	Large
	Standards or references:	Waste management report: https://www.vorarlberg.at/vorarlberg/umwelt_zukunft/umwelt/abfallwirtschaft/neuigkeiten_mitbild_/vorarlbergerlandes-abfall.htm Environment division, garbage collection company in municipality
P.1.22	Electric vehicles / Infrastructures	
	Intent:	To reduce emissions / resource consumption from transportation
	Indicator:	Number of projects
	Unit of measure:	Number
	Information sources:	Measured data
	Assessment method:	Calculate the number of projects (public electricity stations, regional mobility management, shared spaces...)
	Territorial Scale:	All
	Standards or references:	Deutsche Gesellschaft Nachhaltiges Bauen - Nutzungsprofil Stadtquartiere, Plans of the municipalities
P.1.23	Organisation of energy networks	
	Intent:	To assess the sustainable planification and management of the energy networks : electricity, gas and district heating
	Indicator:	Sustainable planification
	Unit of measure:	Y/N
	Information sources:	Planification documents for gas, electricity and district heating networks
	Assessment method:	Analyse of the planification documents searching for significant sustainable criteria. For example priority to renewable production for district heating operation or complementarity/competition between networks study or planification includes a decreasing consumption perspective or planification includes a RES production potential study or biogaz injection in gas network ==> Y/N for electricity, gas or heating networks
	Territorial Scale:	Large
	Standards or references:	CLER TEPOS (french network for the energy transition, Working group for positive energy territories)

P.1.24	Public support to local economy	
	Intent:	To maintain local economy through services provided by local authorities
	Indicator:	Multi services facilities
	Unit of measure:	Unit
	Information sources:	data or statistic from local authorities
	Assessment method:	Number of cities providing multiservices facilities for companies / total number of cities
	Territorial Scale:	Large
	Standards or references:	Agenda 21
P.1.25	Actions of promotion of the social and solidarity economy	
	Intent:	To assess the dynamic of the territory to reduce its vulnerability and mobilize its internal resources
	Indicator:	Study or monitoring
	Unit of measure:	Number
	Information sources:	Subsidies and list of actions carried out on the territory
	Assessment method:	Collection of significant initiatives and actions in the field of social and solidarity economy. 1 point for each significant action
	Territorial Scale:	All
	Standards or references:	CCL CESBA ALPS
P.1.26	Energy improvement of the building stock of modest people	
	Intent:	To assess the efforts of the territory to reduce fuel poverty
	Indicator:	Dwellings of modest people renovated
	Unit of measure:	Number
	Information sources:	Calculated data
	Assessment method:	Calculate the number of housing renovation project with subsidies for modest people (list of policies and subsidies concerning modest people)
	Territorial Scale:	Large
	Standards or references:	Cera (Regional Economic observatory in Rhône Alps), local monitoring, statistics, subsidies form state, counties and local authorities

P1.27	Ensuring/securing quality of cultural landscape	
	Intent:	To preserve quality of cultural landscape
	Indicator:	Number of measures to preserve quality of cultural landscape
	Unit of measure:	x measures / 1000 people
	Information sources:	Statistic data
	Assessment method:	Evaluate the number of measures to preserve quality of cultural landscape, recording cultural landscape preservation measures
	Territorial Scale:	Large
	Standards or references:	Funds for cultural landscape: https://www.vorarlberg.at/vorarlberg/seiten/foerderungen/kulturlandschaft.htm
P1.28	Air quality monitoring stations	
	Intent:	To monitoring the quality of the air
	Indicator:	Monitoring air quality
	Unit of measure:	n
	Information sources:	Measured data
	Assessment method:	Evaluate the number of monitoring station of the air quality in the territory (number per 100.000 inhabitants)
	Territorial Scale:	All
	Standards or references:	ISTAT Statistical National Institute (Italy)

6 Territorial Performance Assessment Module: criteria and indicators

The “Territorial Performance Assessment” (TPA) module allows to measure the performance reached by a territory with regards to 5 main issues:

- A - Territories and Environment
- B - Energy and Resources
- C - Infrastructures and Services
- D – Society
- E - Economy.

The module contains 312 assessment criteria and relative indicators organized in 35 categories. All criteria measure an objective performance on the base of a specific assessment method.

On the base of indicators’ value, the TPA module produces performance scores and ratings at the level of criteria, categories and issues. The assessment method is described in Chapter 3 “CESBA Alps Assessment Methodology”.

List of criteria:

A	TERRITORIES AND ENVIRONMENT
A1	Land
A1.1	Vulnerability of the landscape-environ. system due to the fragmentation produced by linear infrastructure
A1.2	Fragmentation Index
A1.3	Forest Area
A1.4	Soil erosion by water
A1.4 bis	Soil erosion by water
A1.5	Quarries
A1.6	CO2 sequestration through bio-sequestration
A1.7	Carbon storage in forest
A1.8	Carbon Storage in soil
A1.9	Re-naturalization of quarries
A2	Water Quality
A2.1	Environmental State of Watercourses
A2.2	Surface water bodies (rivers and lakes): ecological status
A2.3	Surface water bodies (rivers and lakes): chemical status
A2.4	Good ecological status: surface water bodies (rivers and lakes)
A2.5	Groundwater: punctual chemical status
A2.6	Groundwater: GWB chemical status
A2.7	Good GWB chemical status: Groundwater
A2.8	Surface water quality: ecological status
A2.9	Water quality in rivers

A3	Nature and Biodiversity
A3.1	Green Infrastructure
A3.2	Woodland
A3.3	Areas of natural interest
A3.4	Any wetlands
A3.5	Habitats in Natura 2000
A3.6	Amphibian species
A3.7	Fish species
A3.8	Sustainable Forestry
A3.9	Ecological network
A3.10	Endangered species
A3.11	Fragmentation of natural and semi-natural areas
A3.12	Ecological diversity
A3.13	Distribution of woodland plant species
A3.14	Target species
A3.15	Common bird index
A3.16	HNV farming
A3.17	Degree of implementation of the ecological network
A3.18	Distribution of wood species
A4	Landscape
A4.1	Panoramic roads and historical paths
A4.2	Panoramic and scenic view points
A4.3	Areas available for construction
A4.4	UNESCO Sites
A4.5	Geosites
A4.6	Protected cultural heritage
A4.7	Protected Landscape heritage
A4.8	Protected Natural heritage
A4.9	Traditional Agriculture elements
A4.10	Index of landscape visibility
A4.11	Landscape perception variation
A4.12	Landscape heritage conservation status
A4.13	Protected cultural goods in good conservation status
A4.14	Landscape heritage in good conservation status
A4.15	Natural heritage in good conservation status
A4.16	Protected Cultural heritage in use or accessible
A4.17	Protected Landscape heritage managed
A5	Waste
A5.1	Urban solid waste production (not separated)
A5.2	Separate collection of waste
A5.3	Special waste management
A5.4	Production of special waste (not dangerous)
A5.5	Production of special waste (dangerous)
A5.6	Recycled share of produced waste
A5.7	Tourism impact on waste

A6	Effluents
A6.1	Nitrogen concentration in groundwater
A6.2	Phytosanitary vulnerability
A7	Contaminated Land
A7.1	Decontaminated sites
A7.2	Density of contaminated sites
A7.3	Contaminated land with regards to inhabitants
A8	Emissions
A8.1	Greenhouse gas emissions
A8.2	GHG emission from energetic processes: mobility
A8.3	GHG emission from energetic processes: tertiary sector
A8.4	GHG emission from energetic processes: residential sector
A8.5	GHG emission from energetic processes: industrial sector
A8.6	GHG emission from energetic processes: agricultural sector
A8.7	Emissions of ozone-depleting substances
A8.8	Emissions of acidifying substances
A8.9	Emissions of photo-oxidants
A8.10	GHG emission from energetic processes: waste
A8.11	Residual CO2 Compensation capacity by bio-sequestration
A9	Quality of air
A9.1	Exposure to air pollution
A9.1 bis	Exposure to air pollution
A9.2	Air quality - Concentration of PM2.5
A9.3	Air quality - Concentration of O3
A9.4	Air quality - Concentration of Benzo(a)pyren B(a)P
A9.5	Asbestos roofing
A9.6	Asbestos concentration in the outdoor air
A9.7	Exposure to air pollution
A10	Exposure to non ionising radiation
A10.1	Exposure to ELF Electromagnetic emissions
A10.2	Exposure to RF-MV Electromagnetic emissions
A11	Exposure to ionising radiations
A11.1	Indoor exposure to Radon
A11.2	Cesium 137 concentration
A12	Exposure to noise
A12.1	Exposure of households to noise
A12.2	Exposure to traffic noise
A12.3	Exposure to and annoyance by traffic noise
A13	Industrial azards
A13.1	High risk plants and factories
A13.2	Monitoring of High risk plants and factories

B	ENERGY/RESOURCES CONSUMPTION
B1	Energy Consumptions
B1.1	Final Energy Consumption
B1.2	Final Energy consumptions: tertiary sector
B1.3	Final Energy consumption: residential sector
B1.4	Final Energy consumptions: industrial sector
B1.5	Final Energy consumptions: agricultural sector
B1.6	Final Energy consumptions: mobility
B1.7	Energy consumption of public buildings
B1.8	Primary Energy Consumption
B1.9	Petroleum products sold
B1.10	Electric Energy consumptions: tertiary sector
B1.11	Electric Energy consumption: residential sector
B1.12	Electric Energy consumptions: industrial sector
B1.13	Electric Energy consumptions: agricultural sector
B1.14	Electric Energy consumptions: mobility sector
B1.15	Electric Energy consumptions in urban areas
B1.16	Thermal energy consumption: private buildings
B1.17	Thermal energy consumption: public buildings
B1.18	Thermal energy consumption: industrial buildings
B1.19	Winter sports energy consumption
B1.20	Degree of renewable energy consumed
B1.21	Efficiency in energy use in existing residential buildings
B1.21 bis	Efficiency in energy use in existing residential buildings
B1.22	Efficiency in energy use in existing non residential buildings
B1.22 bis	Efficiency in energy use in existing non residential buildings
B1.23	Energy certified building stock
B1.24	Energy Shift in progress
B2	Sustainable energy
B2.1	Renewable energy locally produced
B2.2	Production Power by Wind
B2.3	Production Power by Water
B2.4	Heat by Biomass
B2.5	Heat by solar thermal sources
B2.6	Heat by geothermal sources
B2.7	Energetic balance of primary energy
B2.8	PV production
B2.9	Biogas production
B2.10	Energy productivity
B3	Water Consumption
B3.1	Consumption of water
B3.2	Consumption of water – Human uses
B3.3	Consumption of water for Agriculture– Non human uses
B3.4	Winter sports water consumption
B3.5	Consumption of water for industry - non human uses

B4	Land and building stock use
B4.1	Efficiency in the use of existing residential building
B4.2	Efficiency in the use of existing non residential building
B4.3	Artificial land consumption
B4.4	Consumption of soil resulting from sealing
B4.5	Level of settlement
B4.6	Intensity of land use
B4.7	Vulnerability of agricultural soil
B4.8	Urbanized area
B4.9	Urbanisable area
B4.10	Land consumption
B4.11	Sprawl
B4.12	Impact area of land use
B4.13	Land consumption by infrastructures
B4.14	Index of reversible soil consumption
B4.15	Index of total soil consumption
B4.16	Recycled share of construction waste
B4.17	Building renovation rate
B4.18	Demolition of degraded buildings
C	INFRASTRUCTURES/SERVICES
C1	Mobility
C1.1	Access to public transportation
C1.2	Performance of the public transport
C1.3	Quality of walkways for pedestrian use
C1.4	Car ownership
C1.5	Transport on demand service
C1.6	Electricity dispensing systems
C1.7	Methane fuel dispensing systems
C1.8	Number of dispensing systems
C1.9	Road Safety
C1.9 bis	Road Safety
C1.10	Linear infrastructures for mobility
C1.11	Modal split of public transport
C1.11 bis	Modal split of public transport
C1.12	Critical infrastructures
C1.13	Car sharing
C1.14	Social tariff and gratuity and free of charge transportation
C1.15	Share of electric mobility
C1.16	Sustainable touristic mobility for cultural goods
C1.17	Public transport demand
C1.18	Cycling pathways
C1.19	Access to commonly used services
C2	Leisure Services
C2.1	Free time facilities
C2.2	Leisure- and recreation-space for settlement area
C2.2 bis	Leisure- and recreation-space for settlement area

C3	Health services
C3.1	Coverage ratio of emergency services
C3.2	Number of doctors in the territory
C3.3	Housing for elderly people
C3.4	Medical provision
C3.5	Access to health services
C4	Education
C4.1	Presence of a school transport vehicles
C4.2	Educational farms
C5	Efficiency of infrastructures
C5.1	District heating density
C5.2	District heating network
C5.3	Efficiency in the distribution of water for human consumption
C5.4	Flexible energy capacity
C6	Information and communication
C6.1	Broadband supply
C6.1 bis	Broadband supply
C6.2	Cell phone connection
C6.3	Ultra-wide band supply
C6.4	Digital divide
C7	Basis-Infrastructure
C7.1	Sewerage connection degree
C7.2	Sewerage system size
C7.3	Sewerage system condition
C7.4	Street lighting network size
D	SOCIETY
D1	Demography
D1.1	Population balance
D1.2	Balance of migration (immigration flows) over the last 5 years
D1.3	Emigration
D1.4	Young people neither in employment nor in education or training
D1.5	Population growth
D1.6	Migration balance
D2	Socio-Economic Aspects
D2.1	Accessibility of disabled people to social housing
D2.2	Evaluation of the fuel poverty
D2.3	Poverty and social exclusion
D2.4	Quality of life - Satisfaction
D2.5	Rate of reported robberies
D2.6	Commuter balance
D2.7	Satisfaction with time distribution
D2.8	Urban/ rural classification
D2.9	Share of social housing in the territory
D2.10	Part of unacceptable and substandard housing in the territory
D2.11	Social water tariff

D2.12	Wage differences between women and men
D2.13	Recipients of economic social assistance
D2.14	Education
D2.15	Environmental education
D2.16	Level of school dropout
D2.17	Rate of university graduate
D2.18	Rate of high school graduate
D2.19	Occupation by gender
D2.19 bis	Occupation by gender
D2.20	Gross Income
D2.21	Affordability of residential rental or cost levels
D2.22	Property of the population and economic security
D2.23	Improvement of the building stock of lower income people
D2.24	Early leavers from education and training
D2.25	Poverty and social exclusion
D2.26	Employment rate of young people (15-24 years old)
D2.27	Unemployment rate
D2.28	Employment rate (15-64 years old)
D2.28 bis	Employment rate (15-64 years old)
D2.29	Design for All
D2.30	Accessibility of protected cultural goods
D2.31	Accessibility of protected landscape heritage
D2.32	Accessibility of protected natural heritage
D2.33	Share of secondary residences
D3	Cultural aspects
D3.1	Degree of promotion of the cultural offer of the State Institutes
D3.2	Degree of diffusion of theatre and musical shows
D3.3	Cultural institutions
D3.4	Public libraries
D3.5	Cultural heritage enhancement
D4	Land Use
D4.1	Plan of land use
D4.2	Green urban areas
D4.3	Public civic and leisure spaces
D5	Antropogenetic risks
D5.1	Forest fire risk
D5.1 bis	Forest fire risk
D5.2	Location of territory relative to zones of fire risk
D5.3	Risk to occupants and facilities from earthquake
D5.4	Population exposed to landslide risk
D5.5	Population exposed to flood risk
D5.6	Population exposed to industrial risk
D5.7	Territory exposed to environmental risks (fire, earthquake, landslide, flood, industrial risk etc)
D5.8	Population exposed to natural risks
D5.8 bis	Population exposed to natural risks
D5.9	Exposure to natural hazards

E	ECONOMY
E1	Local Economy
E1.1	Use of local materials
E1.2	Companies with social/environmental certification
E1.3	Renovation and redevelopment of settlement for production activities abandoned
E1.4	Cover organic meals served in the canteen
E1.5	Budget of RES enterprises
E1.6	Employment in Energy improvement of the building stock
E1.7	Employment in RES enterprises
E1.8	Development of local label
E1.9	Local currencies for local economic systems
E1.10	Local added value
E1.11	Labour migration
E1.12	Train business to sustainable development
E1.13	Green Public Procurement
E1.14	Local forest wood supply chain
E1.15	Promotion of the building sector
E1.16	Voluntary Carbon Market by forest management
E1.17	Assessed sustainable standard
E1.18	Rate of households with potential economic hardship
E1.19	Business creation dynamics
E2	Actions for Innovation
E2.1	Gross enrolment in the Company Register
E2.2	Training of handcrafts, SMEs incubators
E2.3	Research and Development
E2.4	Financial fund for energy saving in SMEs
E2.5	Involvement of citizens and SMEs to the local life, through local networks, partnerships, etc.
E3	Tourism
E3.1	Tourism rate
E3.2	Tourist accommodation capacity
E3.3	Floating population
E3.4	Tourist attractions
E3.5	Bed occupancy rate
E3.6	Summer tourism
E3.7	Touristic cycling pathways
E3.8	Seasonal staff accommodation
E3.9	Ski lifts
E3.10	Agritourism farmhouses
E3.11	Mountain huts
E3.12	Touristic flux
E3.13	Average stay of tourists
E3.14	Touristic pressure
E3.14 bis	Touristic pressure
E3.15	Presence of paths used for tourism
E3.16	Sustainable tourism
E3.17	Sustainable tourism offer

E3.18	Occupation rate of tourist accommodation facilities
E3.19	Average stay of tourists during summer season
E3.20	Average stay of tourists during winter season

E4	Agriculture
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E4.1	Relevance of intensive agriculture
E4.2	Organic farming
E4.3	Economic relevance of agriculture
E4.4	Agricultural population
E4.5	Circular economy and short food systems
E4.6	Agricultural autonomy potential
E4.7	Field (arable) share of agriculture area
E4.8	Agricultural products of quality
E4.9	Food self-sufficiency
E4.10	Genetic diversity in agriculture
E4.11	Biologically cultivated area
E4.12	Use of pesticides
E4.13	Use of fertilizers

E5	Industry
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E5.1	Area for industry
E5.2	Industrial Local Units
E5.3	Efficient use of the industrial areas
E5.4	Economic relevance of industry
E5.5	Resource productivity

E6	Trade commerce
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E6.1	Import/export of food products and beverages
E6.2	Settlements without grocery stores

6.1 A – TERRITORIES AND ENVIRONMENT

A1		Land	
A.1.1		Vulnerability of the landscape-environ. system due to the fragmentation produced by linear infrastructure	
	Intent:	To reduce the vulnerability of the landscape-environmental system due to the fragmentation produced by linear infrastructure	
	Indicator:	Fragmentation caused by roads	
	Unit of measure:	km/kmq	
	Information sources:	Calculated data	
	Assessment method:	<p>Option 1: Calculate the ratio between the extraurban area (natural and agricultural) and the length of roads (and other linear infrastructures) in that area</p> <p>Option 2: Calculate the ratio between the extraurban area (natural and agricultural) and the length of roads without the tunnel sections and viaduct (and other linear infrastructures) in that area</p>	
	Territorial Scale:	All	
	Standards or references:	Environmental Report of Territorial Regional Plan of Lombardy	
A.1.2		Fragmentation Index	
	Intent:	To reduce the vulnerability of the landscape-environmental system due to the fragmentation produced by linear infrastructure	
	Indicator:	Fragmentation caused by roads and other mobility linear infrastructures	
	Unit of measure:	m/Km2	
	Information sources:	Calculated data	
	Assessment method:	<p>Calculate the summation of the lengths of roads (and other linear infrastructures) for type, without the tunnel sections and viaduct in the extraurban area (m).</p> <p>Calculate the extraurban area (natural and agricultural) (Km2)</p> <p>Calculate ratio between the summation and the extraurban area (m/Km2)</p> <p>Calculate</p> $IFI = \sum(o_i \times l_i) / A \text{ (m/km}^2\text{)}$ <p>With:</p> <p>l_i = length of roads (and other linear infrastructures) for type, without the tunnel sections and viaduct in the extraurban area (natural and agricultural)</p> <p>o_i = ecosystemic occlusion coefficients of infrastructures types</p> <p>A = extraurban area (natural and agricultural) considered</p>	

		<p>The coefficient o_i allows to get the weighting of the lengths of the infrastructural segments calibrated on their occlusion character, in particularly an attribution based on a comparative estimate of that character for the different types of infrastructures has been used (in relation to the different types of environmental occlusion that each category achieves against of the wildlife without any further indications at individual species level):</p> <p>$o_1=1$ (or 100%) Level 1 - Highways, beltways and railways (generally total occlusions due to the presence of side fences);</p> <p>$o_2=0.7$ (or 70%) Level 2 - State and regional roads, generally with high traffic volume (pronounced occlusion caused by acoustic disturbance and permanent flow of vehicles);</p> <p>$o_3=0.5$ (or 50%) Level 3 - Provincial roads, usually with medium traffic volume (moderate occlusion capacity due to disturbance conditions);</p> <p>$o_4=0.3$ (or 30%) Level 4 - Municipal roads, generally with traffic volumes varying from day to day, from very high to very low, but with a relationship with local morphology favourable in terms of occlusion.</p>
	Territorial Scale:	Calculate the extraurban area (natural and agricultural) (Km ²)
	Standards or references:	Calculate ratio between the summation and the extraurban area (m/Km ²)
A.1.3 Forest Area		
	Intent:	To assess the extension of forested areas
	Indicator:	Forested areas
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	Calculate the ratio between forested areas and the geographical area considered
	Territorial Scale:	All
	Standards or references:	Lombardy Region, database of land use (DUSAF)
A.1.4 Soil erosion by water		
	Intent:	To reduce soil erosion by water
	Indicator:	Soil loss rate by water
	Unit of measure:	tons/ha/year
	Information sources:	Calculated data
	Assessment method:	Use models and simulation
	Territorial Scale:	All
	Standards or references:	JRC, http://esdac.jrc.ec.europa.eu/content/soil-erosion-water-rusle2015

A.1.4 bis	Soil erosion by water	
	Intent:	To reduce soil erosion by water and measure the effectiveness of forests & other landscapes to prevent erosion
	Indicator:	Ratio of land under high soil erosion risk as classified by the relevant authority
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	Ratio of land under high soil erosion risk divided by the total territory area
	Territorial Scale:	National
	Standards or references:	Environment Statistics, Office of Statistics, National Government of Liechtenstein

A.1.5	Quarries	
	Intent:	To valorise and protect natural heritage and landscape
	Indicator:	Quarry area, for active and abandoned quarries
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	Calculate the ratio between quarries areas and the geographical area considered
	Territorial Scale:	All
	Standards or references:	Geoportal, Quarries register of Lombardy

A.1.6	CO2 sequestration through bio-sequestration	
	Intent:	To increase the carbon sequestration in the Alpine Space by extending the area use for cropland, permanent grassland, forestry, vineyards, orchards and wetlands
	Indicator:	Carbon storage across the landscape
	Unit of measure:	teqCO ₂ /ha
	Information sources:	Calculated data
	Assessment method:	<p>Calculate the CO₂-Sequestration potential as the sum of products of area and carbon sequestration ratio for the different land types including area covered with cropland, permanent grassland, forestry, vineyard, orchard and wetland.</p> $\sum \text{Area}_i [\text{ha}] * \text{Carbon sequestration ratio}_i [\text{teqCO}_2/\text{ha}]$ <p>Where Ratios of carbon sequestration per hectare:</p> <ul style="list-style-type: none"> - Cropland: 188 teqCO₂/ha - Permanent grassland: 298 teqCO₂/ha - Forestry: 285 teqCO₂/ha - Vineyard: 126 teqCO₂/ha - Orchard: 173 teqCO₂/ha - Wetlands: 40 teqCO₂/ha
	Territorial Scale:	All
	Standards or references:	<p>Aktion Moorschutz (2017): Entwässerte Moore sind Klima-Hotspots. Available at https://www.aktion-moorschutz.de/moor-infos/was-ist-ein-moor/bedeutung/klimaschutz.html (14.11.2017).</p> <p>Decision No 529/2013/EU: Decision No 529/2013/EU of the European parliament and of the council of 21 May 2013 on accounting rules on greenhouse gas emissions and removals resulting from activities relating to land use, land-use change and forestry and on information concerning actions relating to those activities (2013-05).</p> <p>Eclancher, G., Gondran, N., Yalamas, P., Mines Saint-Etienne, RhôneAlpEnergie-Environnement (RAEE),</p> <p>Lavaud, J., ARPE Occitanie (2017): Assessment of Carbon Stock and Sequestration in local territories.</p> <p>French Environment and Energy Management Agency (ADEME) (2015): Organic carbon in soils.</p> <p>Meeting climate change and food security changes. Available at http://www.ademe.fr/sites/default/files/assets/documents/organic_carbon_in_soils_gb_8575.pdf (14.11.2017)</p>

A.1.7	Carbon storage in forest	
	Intent:	To adopt mitigation and adaptation measures to climate change
	Indicator:	Carbon storage in forest
	Unit of measure:	ton of CO2 equivalents
	Information sources:	Models and simulation data
	Assessment method:	Evaluation of CO2 storage in forest using the historical series derived from the National Inventory of Emissions, which is carried out each five years from ISPRA and regularly updated to ensure comparability of data
	Territorial Scale:	All
	Standards or references:	https://isprambiente.gov.it https://systemapiemonte.it/cms/privati/ambientey-e-energia/servizi/474-irea-inventario-regionale-delle-emissioni-in-atmosfera
A.1.8	Carbon Storage in soil	
	Intent:	To adopt mitigation and adaptation measures to climate change
	Indicator:	Carbon Storage in soil
	Unit of measure:	ton/ha
	Information sources:	Models and simulation data. The available data regarding the soils of the Piedmont Region are resident in the Pedological Information System
	Assessment method:	IPLA (Wood and Environment Italian Institute) uses a comprehensive regional information base for carbon stocks in soil and forests, built with data from the Regional Forest Inventory and the Piedmont Soil Sheet on scale 1: 250,000, both made on behalf of the Piedmont Region. Regarding carbon dioxide absorption and carbon dioxide monitoring and control, IPLA has been managing a CO2 monitoring station based on Eddy Covariance's techniques since 2002 on behalf of the Piedmont Region
	Territorial Scale:	All
	Standards or references:	IPLA (Wood and Environment Italian Institute): https://ipla.org/ . Regarding carbon dioxide absorption and carbon dioxide monitoring and control: international network (project Carboeurope) and national (Carboitaly project)
A.1.9	Re-naturalization of quarries	
	Intent:	To valorize and protect natural heritage and landscape
	Indicator:	Environmental and territorial recomposition of quarries
	Unit of measure:	%
	Information sources:	Data of the Veneto Region (PRAC, Direzione Difesa del Suolo) and IDT (https://idt2.regione.veneto.it/)
	Assessment method:	Percentage of the re-naturalized or reconstituted quarry areas / total area of quarry areas
	Territorial Scale:	All
	Standards or references:	PRAC (Regional Plan of Quarry Activities), Direzione Regionale Difesa del Suolo

A2		Water Quality	
A.2.1	Environmental State of Watercourses		
	Intent:	To assess the quality of the surface water resources	
	Indicator:	Relationship between the data relating to the Ecological State and data relating to the presence of chemical pollutants	
	Unit of measure:	Index	
	Information sources:	Qualitative data	
	Assessment method:	Evaluate the Ecological State of water crossing the Ecological State and the Chemical State	
	Territorial Scale:	Small - Large	
	Standards or references:	Territorial Monitoring Plan of Piedmont Region, Italian D.lgs 3 april 2006, n. 152 "Environmental Regulation"	

A.2.2		Surface water bodies (rivers and lakes): ecological status
	Intent:	To improve water quality
	Indicator:	Evaluation of the ecological status of surface water body
	Unit of measure:	Index
	Information sources:	Calculated data
	Assessment method:	Data analysis process: verification of the ecological status by the integrated assessment indices for rivers and lakes determined on the basis of the evaluation of the worse data in three year for operative monitoring and in one year for Supervisory monitoring and the verification of the Environmental Quality Standards (EQS) for specific pollutants. The confirmation of the High Quality State is provided by hydromorphological parameters
	Territorial Scale:	All
	Standards or references:	<p>State of Environment Report and Environmental Indicators - ARPA Piemonte. http://relazione.ambiente.piemonte.gov.it/2016/it;</p> <p>European Directive 2000/60/CE (WFD), Directive 2008/105/CE, Directive 2009/90/CE, Italian Legislative Decree 152/06, Decree 131/2008, Decree 17 July 2009, Italian Legislative Decree 219/10, Decree 260/10.</p> <p>Indices for rivers: ICMi (Intercalibration Common Metric Index), IBMR (Macrophyte Biological Index for Rivers), ISECI, (Fish Community Ecological Status), LIMeco (Pollution level by Macroindicators of the ecological status: oxygen, ammoniacal nitrogen, nitrate nitrogen, total phosphorus), STAR_ICMi (Standardisation of River Classification _intercalibration Multimetric Index).</p> <p>Indices for lakes: ICF (Phytoplankton total index), LFI (Lake Fish Index), MTIspecies (Macrophytes Trophic Index species) /MacroIMMI (Macrophytes Italian MultiMetrics Index), LTLeco (TSI - Trophic State Index: trophic level by Total phosphorus, transparency and dissolved oxygen)Indices for rivers: ICMi (Intercalibration Common Metric Index), IBMR (Macrophyte Biological Index for Rivers), ISECI, (Fish Community Ecological Status), LIMeco (Pollution level by Macroindicators of the ecological status: oxygen, ammoniacal nitrogen, nitrate nitrogen, total phosphorus), STAR_ICMi (Standardisation of River Classification _intercalibration Multimetric Index).</p> <p>Indices for lakes: ICF (Phytoplankton total index), LFI (Lake Fish Index), MTIspecies (Macrophytes Trophic Index species) /MacroIMMI (Macrophytes Italian MultiMetrics Index), LTLeco (TSI - Trophic State Index: trophic level by Total phosphorus, transparency and dissolved oxygen)</p>

A.2.3	Surface water bodies (rivers and lakes): chemical status	
	Intent:	To improve water quality
	Indicator:	Evaluation of the chemical status of surface water body
	Unit of measure:	Index
	Information sources:	Calculated data
	Assessment method:	The Chemical Status Assessment has been defined at European level on the basis of a list of 33 + 8 hazardous or priority hazardous substances for which European Environmental Quality Standards (SQAs). The Chemical State may be Good / Not Good
	Territorial Scale:	All
	Standards or references:	<p>State of Environment Report and Environmental Indicators - ARPA Piemonte. http://relazione.ambiente.piemonte.gov.it/2016/it</p> <p>European Directive 2000/60/CE (WFD), Directive 2008/105/CE, Directive 2009/90/CE, Italian Legislative Decree 152/06, Decree 131/2008, Decree 17 July 2009, Italian Legislative Decree 219/10, Decree 260/10, Directive 2008/105 / EC incorporated by Italian Dlgs 219 / 10.</p>
A.2.4	Good ecological status: surface water bodies (rivers and lakes)	
	Intent:	To achieve the EU “good ecological status” objective
	Indicator:	Percentage of surface water bodies in good ecological status
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	<p>Calculate for each surface water bodies the ecological status, with regulatory reference to the WFD Directive 2000/60/CE (WFD),(Annex V of WFD);</p> <p>Verify the number of surface water bodies that reach at least "good" (which is the target of the directive).</p> <p>The percentage of surface water body area in good state (ecological status) shall be calculated as the area of surface water bodies (rivers and lakes) in at least good state (numerator) divided by the total area of surface water bodies (denominator). The result shall then be multiplied by 100 and expressed as a percentage.</p> $\text{Percentage of SWB in good state [\%]} = \frac{\text{Number SWB in good state}}{\text{Total number of SWB}} * 100$
	Territorial Scale:	All
	Standards or references:	<p>State of Environment Report and Environmental Indicators - ARPA Piemonte. http://relazione.ambiente.piemonte.gov.it/2016/it;</p> <p>European Directive 2000/60/CE (WFD), Directive 2008/105/CE, Directive 2009/90/CE Eurostat (2016): Sustainable development in the European Union. A statistical glance from the viewpoint of the UN Sustainable Development Goals. 2016 edition.</p>

A.2.5	Groundwater: punctual chemical status	
	Intent:	To improve water quality
	Indicator:	Evaluation of the punctual chemical quality of groundwater as a groundwater body (GWB)
	Unit of measure:	Index
	Information sources:	Monitored data
	Assessment method:	Index assess the chemical quality of groundwater at the single point of monitoring. The Chemical Status is determined on the basis of Environmental Quality Standards (SQAs) for pesticides and nitrates defined at European level
	Territorial Scale:	All
	Standards or references:	<p>The Chemical Status is determined on the basis of Environmental Quality Standards (SQAs) for pesticides and nitrates defined at Community level by Directive 2006/118 / EC as transposed by DLgs 30/09 and national threshold values for other categories of contaminants.</p> <p>ARPA Piemonte: http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/componenti-ambientali/acqua_sotterranee-stato-chimico-puntuale</p> <p>European Directive 2000/60/CE (WFD), Directive 2008/105/CE, Directive 2009/90/CE, Italian Legislative Decree 152/06, Decree 131/2008, Decree 17 July 2009, Italian Legislative Decree 219/10, Decree 260/10.</p>
A.2.6	Groundwater: GWB chemical status	
	Intent:	To improve water quality
	Indicator:	Evaluation of the chemical quality of groundwater as a groundwater body (GWB)
	Unit of measure:	Index
	Information sources:	Monitored data
	Assessment method:	Monitoring ARPA Piemonte on groundwater bodies; The Chemical Status is not good when the percentage of area under the monitoring points was not good detailed chemical exceeds 20% of the total area of the GWB
	Territorial Scale:	All
	Standards or references:	<p>ARPA Piemonte http://www.arpa.piemonte.gov.it/reporting/core-set-of-indicators/water/status-of-groundwater</p> <p>European Directive 2000/60/CE (WFD), Directive 2008/105/CE, Directive 2009/90/CE, Italian Legislative Decree 152/06, Decree 131/2008, Decree 17 July 2009, Italian Legislative Decree 219/10, Decree 260/10</p>

A.2.7	Good GWB chemical status: Groundwater	
	Intent:	To achieve the EU "good chemical status" objective
	Indicator:	Percentage of groundwater bodies in good chemical status
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	<p>Calculate for each groundwater bodies the chemical status, with regulatory reference to the WFD Directive 2000/60/CE (WFD),(Annex V of WFD) and Directive 2006/118/EC;</p> <p>Verify the number of groundwater bodies that reach "good" (which is the target of the directive)</p> <p>The percentage of groundwater body area in good state (chemical status) shall be calculated as the area of groundwater bodies in good state (numerator) divided by the total area of groundwater bodies (denominator). The result shall then be multiplied by 100 and expressed as a percentage.</p> $\text{Percentage of GWB in good state [\%]} = \frac{\text{Number of GWB in good state}}{\text{Total number of GWB}}$
	Territorial Scale:	All
	Standards or references:	<p>ARPA Piemonte</p> <p>http://www.arpa.piemonte.gov.it/reporting/core-set-of-indicators/water/status-of-groundwater</p> <p>European Directive 2000/60/CE (WFD), Directive 2008/105/CE, Directive 2009/90/CE, Directive 2006/118/EC;</p> <p>Eurostat (2016): Sustainable development in the European Union. A statistical glance from the viewpoint of the UN Sustainable Development Goals. 2016 edition</p> <p>Directive 2009/90/CE: Commission Directive 2009/90/EC</p> <p>Directive 2008/105/CE: Directive 2008/105/EC</p>
A.2.8	Surface water quality: ecological status	
	Intent:	To evaluate quality (biological, physico-chemical, hydromorphological) of watercourse that has good influence on life of different animal species
	Indicator:	Ecological quality of watercourse
	Unit of measure:	%
	Information sources:	Monitored data
	Assessment method:	Calculate the percentage of watercourses that meet the requirements for ecological good state
	Territorial Scale:	All
	Standards or references:	Slovenian Environmental Agency, National Water Quality monitoring

A.2.9	Water quality in rivers	
	Intent:	To assess the quality of water resource evaluating the biochemical oxygen demand in rivers
	Indicator:	The mean annual five-day biochemical oxygen demand in rivers, as an average of all data from available measuring stations
	Unit of measure:	milligrams of O ₂ per litre
	Information sources:	Measured data
	Assessment method:	Measure the amount of oxygen required by aerobic microorganisms to decompose organic matter in a water sample over a period of five days in the dark at 20 °C and is expressed as mg O ₂ /L
	Territorial Scale:	All
	Standards or references:	UN global list of SDG indicators, EUROSTAT http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&pcode=tsdnr330&language=en , EEA

A3	NATURE AND BIODIVERSITY	
A.3.1	Green Infrastructure	
	Intent:	To tackle biodiversity loss, to increase ecosystem resilience to climate change, to preserve the ecosystem services
	Indicator:	Percentage of Green Infrastructures Areas on the total territory
	Unit of measure:	%
	Information sources:	Data banks, Measured data, GIS data
	Assessment method:	"Calculation of the following areas excluding overlapping defined in the corresponding criteria of Generic Framework: <ul style="list-style-type: none"> – Woodland – Areas of natural interest – Any wetlands – Habitat in Natura 2000 – Ecological network – Green urban areas – HNV Farming Calculate the of percentage of Green urban areas over the total area $\text{Percentage of green infrastructure [\%]} = \frac{\text{Green infrastructure area [m}^2\text{]}}{\text{Total area of the territory [m}^2\text{]}} * 100$
	Territorial Scale:	All
	Standards or references:	EEA Technical report No 18/2011 Green infrastructure and territorial cohesion. The concept of green infrastructure and its integration into policies using monitoring systems https://www.eea.europa.eu/publications/green-infrastructure-and-territorial-cohesion Data banks provided by Regional Institution, Measured data, GIS data, Corine Land Cover, Land use/cover areas frame survey (LUCAS)

A.3.2		Woodland	
	Intent:	To improve sustainable forestry	
	Indicator:	Percentage of the territory covered by managed forest areas	
	Unit of measure:	%	
	Information sources:	Monitored data provided by Regional Institution	
	Assessment method:	Verification of managed forest area (ha). Verification of total forest area (ha). Calculation of percentage of managed forest area as share of total forest area	
	Territorial Scale:	All	
	Standards or references:	Piedmont Region - Territorial Plans Forestry (PFT) http://www.systemapiemonte.it/cms/privati/territorio/servizi/526-systema-informativo-forestale-regionale	
A.3.3		Areas of natural interest	
	Intent:	To improve biodiversity (concerning Sic, ZPS, national-regional-provincial protected areas)	
	Indicator:	Percentage between natural areas and geographical area	
	Unit of measure:	%	
	Information sources:	Data banks provided by Regional Institution	
	Assessment method:	Natural area calculation. Geographical area calculation. Percentage between natural area and geographical area	
	Territorial Scale:	All	
	Standards or references:	State of Environment Report and Environmental Indicators - ARPA Piemonte: http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/componenti-ambientali/natura-e-biodiversita_aree-di-interesse-naturalistico	
A.3.4		Any wetlands	
	Intent:	To improve biodiversity	
	Indicator:	Density of protected wetlands/geographical area	
	Unit of measure:	n/m ² ; ha/ha	
	Information sources:	Data banks provided by Regional Institution	
	Assessment method:	Option 1: Calculate the number of wetlands in the geographical area Option 2: Calculate the wetlands area (ha) in a territorial area (ha)	
	Territorial Scale:	All	
	Standards or references:	State of Environment Report and Environmental Indicators - ARPA Piemonte: http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/componenti-ambientali/natura-e-biodiversita_stato-e-trend-delle-specie-ornitiche	

A.3.5	Habitats in Natura 2000	
	Intent:	To assess protected habitats
	Indicator:	Protected habitats in Natura 2000
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	Calculation of the ratio between protected habitats in Natura 2000 and the geographical area considered
	Territorial Scale:	All
	Standards or references:	Standard form of Natura 2000 sites
A.3.6	Amphibian species	
	Intent:	To protect and regenerate domestic amphibian species, and to maintain biodiversity
	Indicator:	Domestic amphibian species types
	Unit of measure:	Number
	Information sources:	Statistic data on native amphibian species
	Assessment method:	Verification of the number of native amphibian species types
	Territorial Scale:	Small
	Standards or references:	Department for the Environment, Government of Liechtenstein
A.3.7	Fish species	
	Intent:	To protect domestic fish species, and to maintain biodiversity
	Indicator:	Domestic fish species
	Unit of measure:	Number
	Information sources:	Statistic data on domestic fish species
	Assessment method:	Verification of the number of domestic fish species types
	Territorial Scale:	Small
	Standards or references:	Department for the Environment, Government of Liechtenstein
A.3.8	Sustainable Forestry	
	Intent:	To preserve the ecosystem
	Indicator:	Forest land certified
	Unit of measure:	%
	Information sources:	Measured data
	Assessment method:	Calculate the forest land certified over the total forest land
	Territorial Scale:	All
	Standards or references:	BMUB - Indikatorenbericht biologische Vielfalt 2014; PEFC, FSC and Naturland Certification, Nationwide Red Lists, Nature conservation associations

A.3.9	Ecological network	
	Intent:	To restore ecological connectivity between protected areas
	Indicator:	Area dedicated to ecological network
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	Calculate the area dedicated to ecological network compared to the area of the municipality. Ecological network is composed by priority areas for biodiversity, all national and regional parks, Natura 2000 sites, corridors, ecological passages, ganglia
	Territorial Scale:	All
	Standards or references:	SIMON – Systema Informativo Monitoraggio PGT - Monitoring Informatic System for Territorial Governance Plans of Lombardy Municipalities, Natura 2000 sites, municipal plan
A.3.10	Endangered species	
	Intent:	To preserve the ecosystem
	Indicator:	Selected groups of species in the Red List Categories
	Unit of measure:	%
	Information sources:	Measured data
	Assessment method:	Calculate the percentage of species of selected groups of species in the Red List Categories
	Territorial Scale:	All
	Standards or references:	BMUB - Indikatorenbericht biologische Vielfalt 2014; Nationwide Red Lists, Nature conservation associations
A.3.11	Fragmentation of natural and semi-natural areas	
	Intent:	Evaluation of the fragmentation of natural/semi-natural lands, measuring the disintegration of the countryside (categories are forests, pasture, agricultural mosaics, semi-natural land, inland waters and wetlands)
	Indicator:	Spread of artificial and/or agricultural surfaces into previously 'core natural/semi-natural' landscapes
	Unit of measure:	%
	Information sources:	Measured data, GIS data
	Assessment method:	Calculate the quadratic mean between the mean values of the patch size of a given area between two dates
	Territorial Scale:	All
	Standards or references:	European Environment Agency Indicators, ISPRA database "Corine Land Cover 2000"

A.3.12	Ecological diversity	
	Intent:	To assess the structural consistency and vulnerability level, compared to the transformations induced by territorial landscape-planning processes, ensuring the richness of the types of landscape elements (habitats) that characterizes the environmental mosaic of each kind of landscape
	Indicator:	Real diversity (H) of each type of landscape / maximum theoretical Diversity (Hmax), calculated using the Shannon formula
	Unit of measure:	Adimensional Index
	Information sources:	Forest map and data on land use
	Assessment method:	Calculate the value of ecological diversity of each landscape (Shannon formula). Index, variable from 0 to 1
	Territorial Scale:	Large
	Standards or references:	Territorial Landscape Plan - Piedmont Region: http://www.regione.piemonte.it/territorio/pianifica/nuovo_ptr.htm
A.3.13	Distribution of woodland plant species	
	Intent:	To preserve the biodiversity
	Indicator:	Number of consistent species as a share of potential vegetation of a woodland area
	Unit of measure:	%
	Information sources:	Monitored data provided by Regional Institution
	Assessment method:	Index target value
	Territorial Scale:	All
	Standards or references:	SIFOR sistema informativo forestale regionale http://www.systemapiemonte.it/popalfa/indaginiPFT/indexCategorieForestali.do
A.3.14	Target species	
	Intent:	To protect biodiversity
	Indicator:	Ecological and relevant types (amphibians, lepidoptera, ...)
	Unit of measure:	Species number / territorial area * year
	Information sources:	Monitored data by Regional Institution
	Assessment method:	Calculate the number of species in the analysed area
	Territorial Scale:	All
	Standards or references:	Piedmont Region - Direttiva Habitat; EEA (European Environment Agency) Report - The IRENA indicator Report

A.3.15	Common bird index	
	Intent:	To evaluate the agricultural ecosystems under particular pressure
	Indicator:	The population status (abundance and diversity) of all common birds in the EU
	Unit of measure:	% (year 1990 = 100)
	Information sources:	Monitored data The source data used for this indicator are provided by the European Bird Census Council (EBCC) and its Pan-European Common Bird Monitoring Scheme (PECBMS) programme
	Assessment method:	Calculate the population abundance and the diversity of a selection of common bird species associated with specific habitats. Rare species are excluded. Three groups of bird species are represented: common farmland species, common forest species and all common bird species which include the farmland species, the forest species and a further common species (generalists, as opposed to the farmland and forest specialists)
	Territorial Scale:	All
	Standards or references:	European Commission, Eco-Innovation Observatory, UN global list of SDG indicators, EUROSTAT (online data code: tsdnr100) http://ec.europa.eu/eurostat/tgm/table.do?tab=table&plugin=1&language=en&pcode=tsdnr100
A.3.16	HNV farming	
	Intent:	To the preserve and enhancement of biodiversity, habitats and ecosystems dependent on agriculture and of traditional rural landscapes
	Indicator:	Percentage of Utilised Agricultural Area farmed to generate High Nature Value (HNV)
	Unit of measure:	%
	Information sources:	Measured data (EU data sets, agricultural census, species and habitat databases, GIS, specific sampling surveys, RDP monitoring data)
	Assessment method:	"Calculate (hectares) the HNV farmland areas (Type 1, Type 2, Type 3) Calculate (hectares) the total UAA (Utilised Agricultural Area) Calculate the percentage of HNV Farming over the total UAA Area"
	Territorial Scale:	Calculate (hectares) the total UAA (Utilised Agricultural Area)
	Standards or references:	https://ec.europa.eu/agriculture/sites/agriculture/files/cap-indicators/impact/2016-impact-indicators-fiches.pdf "The application of the High Nature Value impact indicator" Evaluation Expert Network (2009) http://enrd.ec.europa.eu/app_templates/filedownload.cfm?id=6A6B5D2F-ADF1-0210-3AC3-AD86DFF73554

		<p>http://ec.europa.eu/eurostat/statistics-explained/index.php/Agri-environmental_indicator_-_High_Nature_Value_farmland</p> <p>The data sources for estimation of HNV farming are many and varied, and currently depend on the methods selected by the Member State authorities. Analysis relies principally on national/regional data, but also includes use of some EU data sets.</p>
A.3.17 Degree of implementation of the ecological network		
	Intent:	To restore ecological connectivity between protected areas
	Indicator:	Degree of implementation of the ecological network
	Unit of measure:	%
	Information sources:	Calculated data on Regional data bank
	Assessment method:	Not yet available. This indicator is still under development. It will measure connectivity with respect to obstacles from patches built on the land use map (for target species Directives - not Birds D.).
	Territorial Scale:	All
	Standards or references:	Direzione Commissioni Valutazioni - UO Commissioni VAS VINCA NUVV
A.3.18 Distribution of wood species		
	Intent:	Value biodiversity of woods and resilient biotopes
	Indicator:	Density of softwood species in relation to the forest area
	Unit of measure:	number / km ²
	Information sources:	Local land and water administration
	Assessment method:	Calculation of the average number of species on the over whole forest area, then divided by the total area of the region
	Territorial Scale:	
	Standards or references:	-

A4		LANDSCAPE	
A.4.1	Panoramic roads and historical paths		
	Intent:	To valorise and protect cultural and natural heritage	
	Indicator:	Presence of panoramic roads and historical paths	
	Unit of measure:	km; km/ha; km/geographical area	
	Information sources:	Information data of Landscape Regional Plan	
	Assessment method:	Option 1: Calculate the length of panoramic roads and historical paths Option 2: Calculate the ratio between the length of panoramic roads and historical paths on the territory Option 3: Calculate the ratio between the length of panoramic roads and historical paths on the geographical area	
	Territorial Scale:	All	
	Standards or references:	Geoportal of Lombardy Region	
A.4.2	Panoramic and scenic view points		
	Intent:	To valorise and protect cultural and natural heritage	
	Indicator:	Presence of panoramic and scenic view points	
	Unit of measure:	number; number/ha; number/geographical area	
	Information sources:	Information data of Landscape Regional Plan	
	Assessment method:	Option 1: Calculate the number of panoramic and scenic view points Option 2: Calculate the ratio between the number of panoramic and scenic view points on the territory Option 3: Calculate the ratio between the number of panoramic and scenic view points on the geographical area	
	Territorial Scale:	All	
	Standards or references:	Geoportal of Lombardy Region	
A.4.3	Areas available for construction		
	Intent:	Share of areas available for construction	
	Indicator:	Areas available for construction on total territory	
	Unit of measure:	%	
	Information sources:	Statistical data	
	Assessment method:	Calculate the area available for construction on total territory	
	Territorial Scale:	Small	
	Standards or references:	Slovenian Environmental Agency, CLC (CORINE Land Cover), Ministry of environment and spatial planning, Municipality data, MKO, Register of agricultural and forest land	

A.4.4		UNESCO Sites	
	Intent:	To valorise and protect cultural and natural heritage	
	Indicator:	Presence of Unesco sites	
	Unit of measure:	Number	
	Information sources:	Calculated data	
	Assessment method:	Calculate the number of UNESCO sites on the territory	
	Territorial Scale:	All	
	Standards or references:	UNESCO, Geoportal of Lombardy Region, Landscape Regional Plan	
A.4.5		Geosites	
	Intent:	To valorise and protect cultural and natural heritage	
	Indicator:	Presence of geosites	
	Unit of measure:	Number	
	Information sources:	Calculated data	
	Assessment method:	Calculate the number of geosites on the territory	
	Territorial Scale:	All	
	Standards or references:	Geoportal of Lombardy Region, Landscape Regional Plan	
A.4.6		Protected cultural heritage	
	Intent:	To valorise and protect cultural and natural heritage	
	Indicator:	Percentage of protected cultural goods	
	Unit of measure:	%	
	Information sources:	Data banks	
	Assessment method:	<p>The percentage of protected cultural goods in good state shall be calculated as the number of protected cultural goods in good state (numerator) divided by the total number of protected cultural goods (denominator). The result shall be multiplied by 100 and expressed as a percentage.</p> $\frac{\text{Number of protected cultural goods in good state}}{\text{Total number of protected cultural goods}} * 100$	
	Standards or references:	Geoportal of Lombardy Region, Ministry of cultural goods data banks	

A.4.7	Protected Landscape heritage	
	Intent:	To valorize and protect natural areas
	Indicator:	Percentage of protected landscape
	Unit of measure:	%
	Information sources:	Data banks, Calculation
	Assessment method:	<p>The percentage of protected landscape area that is good state shall be calculated as the area of landscapes protected by national, regional legislation, protection instruments deriving from territorial and urban planning and landscape under special planning control that is good state (numerator) divided by the total area of protected landscape (denominator). The result shall be multiplied by 100 and expressed as a percentage.</p> $\frac{\text{Area of protected landscapes in good state [km}^2\text{]}}{\text{Area of protected landscapes [km}^2\text{]}} * 100$
	Territorial Scale:	All
	Standards or references:	<p>Geoportal of Lombardy Region, Ministry of cultural goods data banks.</p> <p>United Nations Educational, Scientific and Cultural Organization (UNESCO) (2017): Cultural Landscapes.</p>
A.4.8	Protected Natural heritage	
	Intent:	To valorize and protect natural areas
	Indicator:	Percentage of protected natural areas
	Unit of measure:	%
	Information sources:	Data banks, Calculation
	Assessment method:	<p>Calculate the total area of protected natural areas on the territory, without overlapping, taking in account all the types of instruments of natural goods protection which at various institutional levels addressed to natural areas:</p> <ul style="list-style-type: none"> • National Parks • Regional and interregional natural parks • Natural reserves • Special protection zones • Special storage areas • Wetlands of international interest • Other protected natural areas • Terrestrial and Marine Reconnaissance Areas <p>Calculate the percentage surface of protected natural areas compared to the territorial area.</p>
	Territorial Scale:	All
	Standards or references:	<p>Italian Ministry of Environment - Natural Protected Areas National Framework Law</p> <p>http://www.minambiente.it/pagina/classificazione-delle-aree-naturali-protette</p>

A.4.9		Traditional agriculture elements	
	Intent:	To preserve the rural areas' landscape	
	Indicator:	Density of the natural and anthropogenic signs such as characteristic structures, terraces, rows, etc. of the agricultural mosaic in relation to the agricultural area	
	Unit of measure:	number/ha; m/ha	
	Information sources:	Data Bank (GIS) provided by Local and Regional Institutions	
	Assessment method:	<p>Option 1: Verification of the number (n) of rural elements. Verification of territorial area - UAA (useful agricultural area)- (ha). Calculation of the ratio between the number of elements and the territorial area (n/ha).</p> <p>Option 2: Verification of length in meter (m) of rural elements. Verification of territorial area - UAA (useful agricultural area)- (ha). Calculation of the ratio between meter (m) of rural elements and the territorial area- UAA (useful agricultural area)- (ha) (m/ha).</p>	
	Territorial Scale:	Small	
	Standards or references:	<p>IRES - Economic Research Institutes of Piedmont Region (E. Gottero - Un sistema complesso da valutare: il paesaggio rurale. Indicatori a sostegno delle politiche. 2016)</p> <p>http://www.ires.piemonte.it/en/component/ducklibrary/?ultim_epubblicazioni=20</p>	
A.4.10		Index of landscape visibility	
	Intent:	To preserve the landscape quality	
	Indicator:	Density of routes and panoramic view point enjoyed by public	
	Unit of measure:	n/ha; m/ha	
	Information sources:	Data Bank (GIS) provided by Local and Regional Institutions	
	Assessment method:	<p>Option 1</p> <p>Verification of the number (n) of panoramic view point. Verification of territorial area (ha). Calculation of the ratio between the number of panoramic view point and the territorial area (n/ha)</p> <p>Option 2</p> <p>Verification of meter (m) of panoramic routes. Verification of territorial area (ha). Calculation of the ratio between meter (m) of panoramic routes and the territorial area (m/ha).</p>	
	Territorial Scale:	All	
	Standards or references:	<p>Charter of visual sensitivity at the regional level, from the viewpoint surveyed in the Regional Landscape Plan and a visual depth of 5 km.</p> <p>http://relazione.ambiente.piemonte.gov.it/2016/it/territorio/stato/paesaggio</p>	

A.4.11 Landscape perception variation		
	Intent:	Evaluate the impact of Regional Landscape Plan on different values that contribute to the complex evaluation
	Indicator:	Quality value of landscape perception
	Unit of measure:	Quality value
	Information sources:	Statistic data, Data banks
	Assessment method:	Derived data Quality value: Low, medium, high (prevalence of negative transformations, prevalence of unchanged situations, prevalence of positive transformations) Comparison between subsequent observations from 50 viewpoints evenly distributed on the regional territory
	Territorial Scale:	All
	Standards or references:	Territorial Landscape Plan - Piedmont Region: http://www.regione.piemonte.it/territorio/paesaggio/
A.4.12 Landscape heritage conservation status		
	Intent:	Calculate the integrity of the protection instruments value
	Indicator:	Quality value
	Unit of measure:	Quality value
	Information sources:	Statistic data, Data banks
	Assessment method:	Derivated data Quality value: Low, medium -low, medium, medium-high, high The evaluation is carried out by verifying the permanence of the values identified in the protection decree and the compromise factors that occurred after the date of the decree
	Territorial Scale:	All
	Standards or references:	Territorial Landscape Plan - Piedmont Region: http://www.regione.piemonte.it/territorio/paesaggio/ Ministerial Decrees and Declarations of outstanding public interest- MIBACT database

A.4.13	Protected cultural goods in good conservation status	
	Intent:	To improve the integrity of the protected cultural goods
	Indicator:	Percentage of protected cultural goods in good conservation status with respect to the total number
	Unit of measure:	%
	Information sources:	Statistic data, Data banks
	Assessment method:	<p>Calculate the number of protected goods (immovable properties) on the territory, taking in account all the types of instruments of cultural goods protection which at various institutional levels addressed to the goods: singular protected goods for artistic, architectural, monumental, historical and traditional interest, and for archaeological relevance</p> <p>Calculate the number of cultural goods in good conservation status: assessment method qualitative, by comparing the real status with that resulting from the instruments of cultural goods protection:</p> <p>Quality value: Low, medium -low, medium, medium-high, high Good conservation status = medium, medium-high, high</p> <p>Calculate the percentage of protected cultural goods in good conservation status compared to the total number of protected cultural goods.</p>
	Territorial Scale:	All
	Standards or references:	Territorial Landscape Plan - Piedmont Region: http://www.regione.piemonte.it/territorio/paesaggio/ Ministerial Decrees and Declarations of outstanding public interest- MIBACT database

A.4.14	Landscape heritage in good conservation status	
	Intent:	To improve the integrity of the protected landscape heritage
	Indicator:	Percentage of protected landscape heritage in good conservation status with respect to the total landscape protected areas
	Unit of measure:	%
	Information sources:	Statistic data, Data banks
	Assessment method:	<p>Calculate the total area of protected landscape on the territory, without overlapping, taking in account all the types of instruments of landscape goods protection which at various institutional levels addressed to landscape:</p> <p>landscape areas protected for their historical, archaeological, traditional, rural, naturalistic and aesthetic/visual importance, including historical centres and settlements, archaeological areas, Unesco Sites and Unesco Biosphere Reserves</p> <p>Calculate the areas in good conservation status: assessment method qualitative, by comparing the real status with that resulting from the instruments of landscape protection:</p> <p>Quality value: Low, medium -low, medium, medium-high, high Good conservation status = medium, medium-high, high</p> <p>Calculate the percentage surface of protected landscape areas in good conservation status compared to the total protected landscape areas.</p>
	Territorial Scale:	All
	Standards or references:	<p>"Territorial Landscape Plan - Piedmont Region: http://www.regione.piemonte.it/territorio/paesaggio/ Ministerial Decrees and Declarations of outstanding public interest- MIBACT database Managing associations or bodies of landscape areas "</p>

A.4.15	Natural heritage in good conservation status	
	Intent:	To improve the integrity of the protected natural heritage
	Indicator:	%
	Unit of measure:	Percentage of protected natural heritage in good conservation status with respect to the total natural protected areas
	Information sources:	Statistic data, Data banks
	Assessment method:	<p>Calculate the total area of protected natural areas on the territory, without overlapping, taking in account all the types of instruments of natural goods protection which at various institutional levels addressed to natural areas:</p> <ul style="list-style-type: none"> • National Parks • Regional and interregional natural parks • Natural reserves • Special protection zones • Special storage areas • Wetlands of international interest • Other protected natural areas • Terrestrial and Marine Reconnaissance Areas <p>Calculate the areas in good conservation status: assessment method qualitative, by comparing the real status with that resulting from the instruments of natural areas protection: Quality value: Low, medium-low, medium, medium-high, high, referred to the protected natural heritage as defined in A4.9 Good conservation status = medium, medium-high, high</p> <p>Calculate the percentage surface of protected natural areas in good conservation status compared to the total protected areas.</p>
	Territorial Scale:	All
	Standards or references:	Territorial Landscape Plan - Piedmont Region: http://www.regione.piemonte.it/territorio/paesaggio/ Ministerial Decrees and Declarations of outstanding public interest- MIBACT database Managing associations or bodies of Natural areas

A.4.16	Protected Cultural heritage in use or accessible	
	Intent:	To valorize and protect cultural heritage. Thus the intent will be to assess the use (private or public) of the assets (which guarantees its conservation).
	Indicator:	Level of used / accessible cultural heritage (Cultural heritage not abandoned)
	Unit of measure:	%
	Information sources:	Calculated data - Territorial information system of the municipality
	Assessment method:	Percentage of the municipal area on which historical and cultural assets are currently used or accessible (prerequisite for their conservation) on the total municipal area occupied by cultural heritage assets
	Territorial Scale:	All
	Standards or references:	Territorial information system of the municipality
A.4.17	Protected Landscape heritage managed	
	Intent:	To valorize and protect landscape heritage through management and accessibility that guarantees a good state of conservation
	Indicator:	Percentage of Protected Landscape heritage managed
	Unit of measure:	%
	Information sources:	Calculated data - Municipality (regional, provincial) data banks
	Assessment method:	Calculate the percentage of surface of protected landscape heritage managed on total surface of protected landscape heritage of the territory. "Managed" include initiatives for restauration, maintenance, valorization etc.
	Territorial Scale:	All
	Standards or references:	Municipality (regional, provincial) data banks

A5		WASTE	
A.5.1	Urban solid waste production (not separated)		
	Intent:	To reduce the waste production	
	Indicator:	Annual total amount of waste	
	Unit of measure:	Kg/inhabitant year; tons/year	
	Information sources:	Calculated data	
	Assessment method:	<p>Option 1 Verification of total amount of waste(kg) (mixed municipal waste + separate collection of waste + other waste) in a year in a territory. Verification of the number of inhabitants living in the territory. Calculation of the ratio between total amount of waste in a year and the number of inhabitants</p> <p>Option 2 Verification of total amount of waste (ton) in a year in a territory (tons/year)</p>	
	Territorial Scale:	All	
	Standards or references:	EUROSTAT, Regional Environment Protection Agency (ARPA Piemonte) -State of Environment Report and environmental indicators, Legal framework (ITA- EU): DLgs 152/06,DLgs 205/10 (implementation of the Directive 2008/98/EC)	
A.5.2	Separate collection of waste		
	Intent:	To incentive the separate collection of waste	
	Indicator:	Separate waste collection	
	Unit of measure:	Kg/inhabitant year; %	
	Information sources:	Statistic data	
	Assessment method:	<p>Option 1 Verification of total amount of separate waste collection (kg) in a year in a territory. Verification of the number of inhabitants living in the territory. Calculation of the ratio between total amount of separate waste collection in a year and the number of inhabitants (Kg/inhabitant year). Check the achievement of the separate waste collection objectives by legal framework.</p> <p>Option 2 Verification of total amount of separate waste collection (ton) in a year in a territory (tons/year).Verification of total amount of waste (ton) in a year in a territory. Calculation of the percentage of total amount of separate waste collection in a year in relationship to of total amount of waste (ton) in a year in a territory. Check the achievement of the separate waste collection objectives by legal framework</p>	
	Territorial Scale:	All	
	Standards or references:	https://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/pressioni-ambientali/rifiuti_raccolta-differenziata	

A.5.3	Special waste management	
	Intent:	To incentive waste recycle
	Indicator:	Total amount of special waste recycled or reused in a year (recovered waste, incinerated waste, special waste in landfill, special waste with other treatment) into the regional territory
	Unit of measure:	kTons/year
	Information sources:	Monitored data
	Assessment method:	<p>Verification of total amount of recovered waste in a year.</p> <p>Verification of the total amount of incinerated waste in a year.</p> <p>Verification of the total amount of special waste in landfill in a year.</p> <p>Verification of the total amount of special waste with other treatment in a year.</p> <p>Calculation of the total amount of special waste</p>
	Territorial Scale:	Large
	Standards or references:	https://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/pressioni-ambientali/rifiuti_gestione-rifiuti-speciali
A.5.4	Production of special waste (not dangerous)	
	Intent:	To minimize special waste production
	Indicator:	Amount of special waste per inhabitant, not dangerous (old appliances, from commercial activities, construction and demolition waste etc.) in a territory
	Unit of measure:	Ktons/year; tons/inhabitant year
	Information sources:	Monitored data
	Assessment method:	<p>Option 1</p> <p>Verification of total amount of special not dangerous waste in a year (Ktons/year)</p> <p>Option 2</p> <p>Verification of total amount of special not dangerous waste in a year (ton). Verification of the number of inhabitants living in the territory. Calculation of the ratio between total amount of special not dangerous waste in a year and the number of inhabitants (ton/inhabitant year)</p>
	Territorial Scale:	All
	Standards or references:	https://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/pressioni-ambientali/rifiuti_produzione-rifiuti-speciali-non-pericolosi

A.5.5	Production of special waste (dangerous)	
	Intent:	To minimize waste production
	Indicator:	Amount of special waste per inhabitant, dangerous (i.e. batteries)
	Unit of measure:	Ktons/year; tons/inhabitant year
	Information sources:	Monitored data
	Assessment method:	Option 1 Verification of total amount of special dangerous waste in a year (Ktons/year). Option 2 Verification of total amount of special dangerous waste in a year (ton). Verification of the number of inhabitants living in the territory. Calculation of the ratio between total amount of special dangerous waste in a year and the number of inhabitants (ton/inhabitant year).
	Territorial Scale:	All
	Standards or references:	https://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/pressioni-ambientali/rifiuti_produzione-rifiuti-speciali-pericolosi
A.5.6	Recycled share of produced waste	
	Intent:	To increase the separated collection of waste
	Indicator:	Recycling rate
	Unit of measure:	%
	Information sources:	Measured data
	Assessment method:	The recycled share of produced solid waste shall be calculated as the amount of recycled solid waste in tons (numerator) divided by the total amount of solid waste produced in the territory in tons (denominator). The result shall then be multiplied by 100 and expressed as a percentage.
	Territorial Scale:	All
	Standards or references:	ISO 37120:2014-05: Sustainable development of communities – Indicators for city services and quality of life (2014-05)
A.5.7	Tourism impact on waste	
	Intent:	Identify the contribution of the tourism sector to the production of municipal waste
	Indicator:	Tourism impact on waste
	Unit of measure:	%
	Information sources:	Measured data
	Assessment method:	Calculate the kg production of waste per inhabitant per year
	Territorial Scale:	All
	Standards or references:	United Nations Environment Programme (UNEP)

A6		EFFLUENTS	
A.6.1	Nitrogen concentration in groundwater		
	Intent:	To minimise nitrate content in groundwater	
	Indicator:	Annual mean values of nitrate concentration at several selected sites or nitrate concentration in groundwater	
	Unit of measure:	mg/l	
	Information sources:	Calculated data	
	Assessment method:	Measuring the annual maximum value of nitrate concentration at selected sites, then calculating the annual mean value overall based on these measurements	
	Territorial Scale:	Small / All	
	Standards or references:	Department for the Environment, Government of Liechtenstein, data provided by Arpa Piemonte	
A.6.2	Phytosanitary vulnerability		
	Intent:	To minimise water pollution	
	Indicator:	Phytosanitary concentration in surface aquifer and groundwater	
	Unit of measure:	µg/L	
	Information sources:	Monitored data	
	Assessment method:	Monitoring procedure to verifying that the Phytosanitary concentration is below the value (Average annual value <1µg/L for each active substances; Average annual value for total phytosanitary <0,5 µg/L	
	Territorial Scale:	All	
	Standards or references:	Regional Environment Protection Agency (ARPA Piemonte): Report on the state of the environment https://www.arpa.piemonte.gov.it/reporting/rsa_2009/acqua2009-2 http://www.arpa.piemonte.gov.it/news/il-monitoraggio-della-qualita-delle-acque-come-strumento-di-supperto-alle-politiche-ambientali Directive 2006/118 / EC	

A7		CONTAMINATED LAND	
A.7.1	Decontaminated sites		
	Intent:	To reduce the contamination of soil	
	Indicator:	Decontaminated sites over the total contaminated area	
	Unit of measure:	%	
	Information sources:	Monitored data	
	Assessment method:	Calculate the ratio between the surface of decontaminated sites and the total contaminated area	
	Territorial Scale:	All	
	Standards or references:	Geoportal of Lombardy Region	
A.7.2	Density of contaminated sites		
	Intent:	To reduce the contamination of soil	
	Indicator:	Number of contaminated sites with regards to the territory	
	Unit of measure:	n/1.000 Km ² ; %	
	Information sources:	Data Banks	
	Assessment method:	<p>Option 1: Verification of the number of contaminated sites. Calculation of the ratio between number of contaminated sites and the territorial area (n/1.000 Km²)</p> <p>Option 2: Verification of the total extension of contaminated sites. Calculation of the percentage of extension of contaminated sites in relationship to the territorial area (%)</p>	
	Territorial Scale:	Large	
	Standards or references:	https://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/pressioni-ambientali/siti-contaminati_siti-rispetto-alla-popolazione-e-alla-superficie	

A.7.3		Contaminated land with regards to inhabitants	
	Intent:	To reduce the contamination of soil	
	Indicator:	Number of contaminated sites with regards inhabitants	
	Unit of measure:	n/10.000 inhabitants; m2/inhabitants	
	Information sources:	Data Banks	
	Assessment method:	<p>Option 1 Verification of the number of contaminated sites. Verification of the number of inhabitants living in the territory. Calculation of the ratio between number of contaminated sites and each 10.000 inhabitants.</p> <p>Option 2 Verification of the total extension of contaminated sites. Verification of the number of inhabitants living in the territory. Calculation of the ratio between the total extension of contaminated sites and the number of inhabitants living in the territory (n/inhabitant)</p>	
	Territorial Scale:	All	
	Standards or references:	https://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/pressioni-ambientali/siti-contaminati_siti-rispetto-alla-popolazione-e-alla-superficie	

A8		EMISSIONS	
A.8.1		Greenhouse gas emissions	
	Intent:	To reduce the emissions of greenhouse gases in total man-made emissions contributing to global warming	
	Indicator:	Annual CO2-equivalent emissions (Co2, N2o, CH4, HFCs,PFCs,NF ₃ , SF ₆)	
	Unit of measure:	t CO2 equivalent/inh.*a	
	Information sources:	Measured data	
	Assessment method:	The greenhouse gas emissions per capita shall be calculated as the total amount of greenhouse gases in tons (t CO2-equivalent units) generated over the calendar year within the region (numerator) divided by the territory's total population (denominator). The result shall be expressed as the total greenhouse gas emissions per capita in t CO2 equivalent/inh*a.	
	Territorial Scale:	All	
	Standards or references:	UN global list of SDG indicators, EUROSTAT http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&pcode=t2020_30&language=en . The source data is provided by the European Environment Agency (EEA). It is based on the EU's annual GHG inventory reports to the United Nations Framework Convention on Climate Change (UNFCCC)	

A.8.2	GHG emission from energetic processes: mobility	
	Intent:	To minimize the amount of CO ₂ -equivalent emissions from all energy used for mobility
	Indicator:	Annual CO ₂ -equivalent emissions (Co ₂ , N ₂ o, CH ₄)
	Unit of measure:	Tons/year
	Information sources:	Estimated data
	Assessment method:	Model and simulation to estimate the emissions of various pollutants at municipal, provincial and regional level for different types of activities. The classification used is the one adopted in the framework of inventories EMEP - CORINAIR
	Territorial Scale:	All
	Standards or references:	Piedmont Region-Regional inventory of emissions into the atmosphere: http://www.systemapiemonte.it/fedwinemar/elenco.jsp
A.8.3	GHG emission from energetic processes: tertiary sector	
	Intent:	To minimize the amount of CO ₂ -equivalent emissions from all energy used in the tertiary sector
	Indicator:	Annual CO ₂ -equivalent emissions (Co ₂ , N ₂ o, CH ₄)
	Unit of measure:	Tons/year
	Information sources:	Estimated data
	Assessment method:	Model and simulation to estimate the emissions of various pollutants at municipal, provincial and regional level for different types of activities. The classification used is the one adopted in the framework of inventories EMEP - CORINAIR
	Territorial Scale:	All
	Standards or references:	Piedmont Region-Regional inventory of emissions into the atmosphere: http://www.systemapiemonte.it/fedwinemar/elenco.jsp
A.8.4	GHG emission from energetic processes: residential sector	
	Intent:	To minimize the amount of CO ₂ -equivalent emissions from all energy used in the residential sector
	Indicator:	Annual CO ₂ -equivalent emissions (Co ₂ , N ₂ o, CH ₄)
	Unit of measure:	Tons/year
	Information sources:	Estimated data
	Assessment method:	Model and simulation to estimate the emissions of various pollutants at municipal, provincial and regional level for different types of activities. The classification used is the one adopted in the framework of inventories EMEP - CORINAIR
	Territorial Scale:	All
	Standards or references:	Piedmont Region-Regional inventory of emissions into the atmosphere: http://www.systemapiemonte.it/fedwinemar/elenco.jsp

A.8.5	GHG emission from energetic processes: industrial sector	
	Intent:	To minimize the amount of CO ₂ -equivalent emissions from all energy used in the industrial sector
	Indicator:	Annual CO ₂ -equivalent emissions (Co ₂ , N ₂ o, CH ₄)
	Unit of measure:	Tons/year
	Information sources:	Estimated data
	Assessment method:	Model and simulation to estimate the emissions of various pollutants at municipal, provincial and regional level for different types of activities. The classification used is the one adopted in the framework of inventories EMEP - CORINAIR
	Territorial Scale:	All
	Standards or references:	Piedmont Region-Regional inventory of emissions into the atmosphere: http://www.systemapiemonte.it/fedwinemar/elenco.jsp
A.8.6	GHG emission from energetic processes: agricultural sector	
	Intent:	To minimize the amount of CO ₂ -equivalent emissions from all energy used in the agricultural sector
	Indicator:	Annual CO ₂ -equivalent emissions (Co ₂ , N ₂ o, CH ₄)
	Unit of measure:	Tons/year
	Information sources:	Estimated data
	Assessment method:	Model and simulation to estimate the emissions of various pollutants at municipal, provincial and regional level for different types of activities. The classification used is the one adopted in the framework of inventories EMEP - CORINAIR
	Territorial Scale:	All
	Standards or references:	Piedmont Region-Regional inventory of emissions into the atmosphere: http://www.systemapiemonte.it/fedwinemar/elenco.jsp
A.8.7	Emissions of ozone-depleting substances during facility operations	
	Intent:	To minimize Ozone Depletion from leakage of CFC-11 equivalent
	Indicator:	CFC-11 equivalent, in gm per m ² per yr
	Unit of measure:	gm / m ² per yr
	Information sources:	Contract documents and equipment specifications
	Assessment method:	Evaluate the predicted emission of CFC-11 equivalent, based on the amount and type of refrigerants in the building, in gm per year
	Territorial Scale:	All
	Standards or references:	SBTool iiSBE International

A.8.8 Emissions of acidifying emissions during facility operations		
	Intent:	To minimize the production of atmospheric emissions from building operations that may result in acidification
	Indicator:	SO2 Equiv. per year in kg. per unit net area
	Unit of measure:	Kg. / m2 per yr
	Information sources:	Contract documents and equipment specifications, or EPD
	Assessment method:	Evaluate SO2 equivalent per year in kg. per unit net area
	Territorial Scale:	All
	Standards or references:	SBTool iiSBE International

A.8.9 Emissions leading to photo-oxidants during facility operations		
	Intent:	To minimize the production of atmospheric emissions from building operations that may result in photo-oxidants
	Indicator:	Ethene equivalent per year in gm per net unit area
	Unit of measure:	gm./m2 per yr
	Information sources:	Contract documents and equipment specifications, or EPD
	Assessment method:	Evaluate ethene equivalent per year in gm per net unit area
	Territorial Scale:	All
	Standards or references:	SBTool iiSBE International

A.8.10 GHG emission from energetic processes: waste		
	Intent:	"To minimize the amount of CO2-equivalent emissions from all energy used in the waste processing sector"
	Indicator:	Annual CO2-equivalent emissions (Co2, N2o, CH4)
	Unit of measure:	CO2 equivalent (kt)/year
	Information sources:	Estimated data
	Assessment method:	Calculate the annual CO2-equivalent emissions from four source categories: solid waste disposal; biological treatment of solid waste; incineration and open burning of waste; and wastewater treatment and discharge
	Territorial Scale:	All
	Standards or references:	Technical standards in the waste sector of Liechtenstein correspond to Swiss standards. Switzerland's country specific methodology and/or emission factors are usually adopted. Wherever available, country specific data have been used, e.g. activity data for unmanaged waste disposal sites or for the estimation of CH4 from wastewater treatment. Source: Liechtenstein's Greenhouse Gas Inventory

A.8.11	Residual CO2 Compensation capacity by bio-sequestration	
	Intent:	To implement climate mitigation strategies
	Indicator:	Residual CO2 compensation capacity through bio-sequestration, by comparing the CO2 storage capacity with the local emission scenario
	Unit of measure:	%
	Information sources:	Calculated data: Corine landcover, INEMAR
	Assessment method:	"Calculate the CO2-Sequestration potential as the sum of products
	Territorial Scale:	of area and carbon sequestration ratio for the different land types including area covered with cropland, permanent grassland, forestry, vineyard, orchard and wetland.
	Standards or references:	Σ_Area_i [ha] * Carbon sequestration ratio [teqCO ₂ /ha]

A9		QUALITY OF AIR	
A.9.1	Exposure to air pollution		
	Intent:	Ensure that the annual average concentration of the particulate in the atmosphere (microscopic particles having a diameter less than 10 mm) is within the limit value for human health	
	Indicator:	Counting of the daily limit of PM10 exceedances	
	Unit of measure:	d	
	Information sources:	Monitoring plan	
	Assessment method:	The exposure to air pollution shall be represented by the number of days, which have exceeded the daily limit of Particulate Matter (PM10) concentration throughout one year.	
	Territorial Scale:	All	
	Standards or references:	"Territorial Monitoring Plan of Piedmont Region, Italian Ministerial Decree 2 april 2002, n. 60 about ""air quality value limits ISO 37120:2014-05: Sustainable development of communities – Indicators for city services and quality of life (2014-05)	
A.9.1 bis	Exposure to air pollution		
	Intent:	Ensure that the annual average concentration of the particulate in the atmosphere (microscopic particles having a diameter less than 10 mm) is within the limit value for human health	
	Indicator:	Counting of the daily limit of PM10 exceedances	
	Unit of measure:	Number	
	Information sources:	http://www.arpa.veneto.it/arpavinforma/indicatori-ambientali/indicatori_ambientali/atmosfera/qualita-dellaria/livelli-di-concentrazione-di-polveri-fini-pm10/view	
	Assessment method:	ARPAV - number of exceedances of the daily Limit Value (VL) in the year per station (50 µg / m ³ not to be exceeded more than 35 times / year, equal to 0.10), normalized with respect to the number of days of detection / year	
	Territorial Scale:	All	
	Standards or references:	ARPAV - Regional Agency for the prevention and environmental protection of the Veneto region	
A.9.2	Air quality - Concentration of PM2.5		
	Intent:	Respecting law limits of pollutant concentration - PM2.5	
	Indicator:	Annual average concentration	
	Unit of measure:	µg/m ³	
	Information sources:	Measured data	
	Assessment method:	Consider annual average concentration statistic based on the data measured by the nearest detection unit to the territory (law limits for PM2.5: max 25 µg/m ³ as annual average)	
	Territorial Scale:	All	
	Standards or references:	ARPA - Regional Agency for environment protection, INEMAR - INventario Emissioni Aria, Regional Environmental Agencies	

A.9.3		Air quality - Concentration of O3	
	Intent:	Respecting law limits of pollutant concentration - O3	
	Indicator:	Days of exceedances of law limits for O3 - target value for human health	
	Unit of measure:	Number	
	Information sources:	Measured data	
	Assessment method:	Consider the number of days of exceedances of law limits for O3, statistic based on the data measured by the nearest detection unit to the territory (120 µg/m3 as 8 hours average, max 25 times for year)	
	Territorial Scale:	All	
	Standards or references:	ARPA - Regional Agency for environment protection, INEMAR - INventario EMISSIONI Aria, Regional Environmental Agencies	
A.9.4		Air quality - Concentration of Benzo(a)pyren B(a)P	
	Intent:	Respecting law limits of pollutant concentration - B(a)P	
	Indicator:	Annual average concentration B(a)P	
	Unit of measure:	ng/m3	
	Information sources:	Measured data	
	Assessment method:	Calculate the annual average concentration of B(a)P, statistic based on the data measured by the nearest detection unit to the territory (law limits for B(a)P: max 1 ng/m3 as annual average)	
	Territorial Scale:	All	
	Standards or references:	ARPA - Regional Agency for environment protection, INEMAR - INventario EMISSIONI Aria, Regional Environmental Agencies	
A.9.5		Asbestos roofing	
	Intent:	Reducing risks	
	Indicator:	Surface of asbestos roofing	
	Unit of measure:	m2; m2/km2	
	Information sources:	Measured data	
	Assessment method:	Option 1: Calculate the surface of asbestos roofing Option 2: Calculate the surface of asbestos roofing in the area	
	Territorial Scale:	All	
	Standards or references:	ARPA LOMBARDY- Regional Agency for environment protection, Regional Environmental Agencies	

A.9.6	Asbestos concentration in the outdoor air	
	Intent:	To protect inhabitant's health
	Indicator:	Concentration of fibers in the air
	Unit of measure:	Number / liter
	Information sources:	Measured data
	Assessment method:	The indicator evaluates the presence of asbestos fibers in the collected air sample. The amount of aerodispersed fiber is measured by correlating the number of fibers to the volume of air sampled. The fibers are counted in the laboratory in electronic microscopy because it is the only technique capable of recognizing asbestos from other fibers and distinguishing the type of asbestos on the membrane
	Territorial Scale:	All
	Standards or references:	https://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/pressioni-ambientali/amianto_concentrazione-di-fibre-aerodisperse
A.9.7	Exposure to air pollution	
	Intent:	Evaluate the concentration of the particulate in the atmosphere
	Indicator:	Urban population exposure to air pollution by particulate matter
	Unit of measure:	µg/m ³
	Information sources:	Calculated data
	Assessment method:	Calculate the concentration of PM10 and PM2.5
	Territorial Scale:	All
	Standards or references:	UN global list of SDG indicators, EUROSTAT http://ec.europa.eu/eurostat/tgm/refreshTableAction.do?table&plugin=1&pcode=tsdph370&language=en , the data is updated annually by the European Environment Agency (EEA) assisted by the Topic Centre on Air Pollution and Climate Change Mitigation (ETC/ACM)

A10		EXPOSURE TO NON IONISING RADIATION	
A.10.1	Exposure to ELF Electromagnetic emissions		
	Intent:	To minimize the exposition of inhabitants to ELF magnetic fields	
	Indicator:	Extension of high voltage electric lines	
	Unit of measure:	Km/Km2	
	Information sources:	Statistic data	
	Assessment method:	Verification of high voltage electric lines length (km). Verification of area (km2). Calculation of the ratio between length (km) and area (km2)	
	Territorial Scale:	Large	
	Standards or references:	https://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/pressioni-ambientali/radiazioni-non-ionizzanti_estensione-linee-elettriche	
A.10.2	Exposure to RF-MV Electromagnetic emissions		
	Intent:	To minimize the exposition of inhabitants to high frequency electromagnetic fields	
	Indicator:	Density of telecommunications installations	
	Unit of measure:	number/Km2	
	Information sources:	Statistic data	
	Assessment method:	Verification of telecommunications installations number (n). Verification of area (km2). Calculation of the ratio between number (n) and area (km2)	
	Territorial Scale:	Large	
	Standards or references:	https://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/pressioni-ambientali/radiazioni-non-ionizzanti_densita-impianti-telecomunicazione	

A11		EXPOSURE TO IONISING RADIATION	
A.11.1	Indoor exposure to Radon		
	Intent:	To reduce the exposition to ionising radiation	
	Indicator:	Radon (Rn-222) concentration in the indoor air	
	Unit of measure:	Becquerel / m3	
	Information sources:	Monitoring data	
	Assessment method:	Monitoring network	
	Territorial Scale:	All	
	Standards or references:	State of Environment Report and Environmental Indicators - ARPA Piemonte monitoring data	
A.11.2	Cesium 137 concentration		
	Intent:	To reduce the exposition to ionising radiation	
	Indicator:	Concentration of Cesium 137 in the environment	
	Unit of measure:	Becquerel / m2 (Bq/m2)	
	Information sources:	Measured data	
	Assessment method:	Ratio between a Cesium concentration (Bq) in a square metre (m2) of soil	
	Territorial Scale:	Small	
	Standards or references:	https://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/pressioni-ambientali/radiazioni-ionizzanti_-reti-monitoraggio-concentrazione-attivita-cesio137-in-matrici-ambientali	

A12		EXPOSURE TO NOISE	
A.12.1	Exposure of households to noise		
	Intent:	To reduce the exposure of settlements to noise caused by traffic, industry or agriculture	
	Indicator:	Share of exposed households over the total households	
	Unit of measure:	%	
	Information sources:	Public statistics, Measurements	
	Assessment method:	The percentage of exposed residential area shall be calculated by mapping the noise level Lden (day-evening-night) likely to cause annoyance as given in ISO 1996-2:1987, identifying the areas of the region where Lden is greater than 55 dB(A) and dividing these exposed areas by the total area residential areas. The result shall then be multiplied by 100 and expressed as a percentage.	
	Territorial Scale:	All	
	Standards or references:	Directive 2002/49/ES: Directive 2002/49/EC of the European parliament and of the council of 25 June 2002 relating to the assessment and management of environmental noise (2002-06)	
A.12.2	Exposure to traffic noise		
	Intent:	To assess the share of population exposed to the excess noise	
	Indicator:	Exposure to traffic noise	
	Unit of measure:	Number; %	
	Information sources:	Calculated data	
	Assessment method:	Option 1: Calculate the number of people exposed to excess noise Option 2: Number of people exposed to excess noise to the total population	
	Territorial Scale:	Large	
	Standards or references:	Slovenian Environment Agency, Environmental indicators in Slovenia (PR18), EU Directive 2002/49/ES, EU Directive 2002/49/ES	
A.12.3	Exposure to and annoyance by traffic noise		
	Intent:	Highlight numbers of people remain exposed to high levels of noise from rail and aircraft	
	Indicator:	Share of population exposed to different traffic noise levels	
	Unit of measure:	%	
	Information sources:	Measured data	
	Assessment method:	Estimate the percentage of population exposed to different road traffic noise levels	
	Territorial Scale:	All	
	Standards or references:	EEA – European Environment Agency http://www.eea.europa.eu/data-and-maps/indicators/traffic-noise-exposure-and-annoyance#toc-1	

A13 INDUSTRIAL RISKS															
A.13.1	High risk plants and factories														
	<table border="1"> <tr> <td>Intent:</td> <td>To reduce dangerous substances into the environment</td> </tr> <tr> <td>Indicator:</td> <td>Number of high risk plants and factories/geographical area</td> </tr> <tr> <td>Unit of measure:</td> <td>number/ area (km² or ha)</td> </tr> <tr> <td>Information sources:</td> <td>Measured data</td> </tr> <tr> <td>Assessment method:</td> <td> Verification of the number of high risk plants and factories. Verification of territorial area. Calculation of the ratio between the number of high risk plants and factories and the territorial area </td> </tr> <tr> <td>Territorial Scale:</td> <td>Large</td> </tr> <tr> <td>Standards or references:</td> <td>https://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/uso-delle-risorse/industria_stabilimenti-a-rischio-di-incidente-rilevante-rir</td> </tr> </table>	Intent:	To reduce dangerous substances into the environment	Indicator:	Number of high risk plants and factories/geographical area	Unit of measure:	number/ area (km ² or ha)	Information sources:	Measured data	Assessment method:	Verification of the number of high risk plants and factories. Verification of territorial area. Calculation of the ratio between the number of high risk plants and factories and the territorial area	Territorial Scale:	Large	Standards or references:	https://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/uso-delle-risorse/industria_stabilimenti-a-rischio-di-incidente-rilevante-rir
Intent:	To reduce dangerous substances into the environment														
Indicator:	Number of high risk plants and factories/geographical area														
Unit of measure:	number/ area (km ² or ha)														
Information sources:	Measured data														
Assessment method:	Verification of the number of high risk plants and factories. Verification of territorial area. Calculation of the ratio between the number of high risk plants and factories and the territorial area														
Territorial Scale:	Large														
Standards or references:	https://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/uso-delle-risorse/industria_stabilimenti-a-rischio-di-incidente-rilevante-rir														
A.13.2	Monitoring of High risk plants and factories														
	<table border="1"> <tr> <td>Intent:</td> <td>To reduce dangerous substances into the environment</td> </tr> <tr> <td>Indicator:</td> <td>Number of controls of high risk plants and factories/geographical area</td> </tr> <tr> <td>Unit of measure:</td> <td>number/ area (m² or ha)</td> </tr> <tr> <td>Information sources:</td> <td>Measured data</td> </tr> <tr> <td>Assessment method:</td> <td> Verification of the number of controls of high risk plants and factories. Verification of geographical area. Calculation of the ratio between the number of controls of high risk plants and factories and the geographical area </td> </tr> <tr> <td>Territorial Scale:</td> <td>All</td> </tr> <tr> <td>Standards or references:</td> <td>https://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/uso-delle-risorse/industria_controlli-negli-stabilimenti-rir</td> </tr> </table>	Intent:	To reduce dangerous substances into the environment	Indicator:	Number of controls of high risk plants and factories/geographical area	Unit of measure:	number/ area (m ² or ha)	Information sources:	Measured data	Assessment method:	Verification of the number of controls of high risk plants and factories. Verification of geographical area. Calculation of the ratio between the number of controls of high risk plants and factories and the geographical area	Territorial Scale:	All	Standards or references:	https://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/uso-delle-risorse/industria_controlli-negli-stabilimenti-rir
Intent:	To reduce dangerous substances into the environment														
Indicator:	Number of controls of high risk plants and factories/geographical area														
Unit of measure:	number/ area (m ² or ha)														
Information sources:	Measured data														
Assessment method:	Verification of the number of controls of high risk plants and factories. Verification of geographical area. Calculation of the ratio between the number of controls of high risk plants and factories and the geographical area														
Territorial Scale:	All														
Standards or references:	https://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/uso-delle-risorse/industria_controlli-negli-stabilimenti-rir														

6.2 B- ENERGY/RESOURCES CONSUMPTION

B1 ENERGY CONSUMPTIONS															
B.1.1	Final Energy Consumption														
	<table border="1"> <tr> <td>Intent:</td> <td>To reduce final energy consumptions</td> </tr> <tr> <td>Indicator:</td> <td>Final Energy consumption per capita</td> </tr> <tr> <td>Unit of measure:</td> <td>kWh/inh.*a</td> </tr> <tr> <td>Information sources:</td> <td>Consumption data provided by the distribution system operators or official statistics; the territorial surface and the number of inhabitants comes from the competent public authorities</td> </tr> <tr> <td>Assessment method:</td> <td>The final energy consumption per capita shall be calculated as the final energy consumption in kWh/a caused by households, (numerator) divided by the territory's total population (denomin)</td> </tr> <tr> <td>Territorial Scale:</td> <td>All (difficult to estimate in small scale)</td> </tr> <tr> <td>Standards or references:</td> <td>European Environment Agency (2017): Final energy consumption by sector and fuel. Available at https://www.eea.europa.eu/data-and-maps/indicators/final-energy-consumption-by-sector-9/assessment-1 (14.11.2017)</td> </tr> </table>	Intent:	To reduce final energy consumptions	Indicator:	Final Energy consumption per capita	Unit of measure:	kWh/inh.*a	Information sources:	Consumption data provided by the distribution system operators or official statistics; the territorial surface and the number of inhabitants comes from the competent public authorities	Assessment method:	The final energy consumption per capita shall be calculated as the final energy consumption in kWh/a caused by households, (numerator) divided by the territory's total population (denomin)	Territorial Scale:	All (difficult to estimate in small scale)	Standards or references:	European Environment Agency (2017): Final energy consumption by sector and fuel. Available at https://www.eea.europa.eu/data-and-maps/indicators/final-energy-consumption-by-sector-9/assessment-1 (14.11.2017)
Intent:	To reduce final energy consumptions														
Indicator:	Final Energy consumption per capita														
Unit of measure:	kWh/inh.*a														
Information sources:	Consumption data provided by the distribution system operators or official statistics; the territorial surface and the number of inhabitants comes from the competent public authorities														
Assessment method:	The final energy consumption per capita shall be calculated as the final energy consumption in kWh/a caused by households, (numerator) divided by the territory's total population (denomin)														
Territorial Scale:	All (difficult to estimate in small scale)														
Standards or references:	European Environment Agency (2017): Final energy consumption by sector and fuel. Available at https://www.eea.europa.eu/data-and-maps/indicators/final-energy-consumption-by-sector-9/assessment-1 (14.11.2017)														
B.1.2	Final Energy consumptions: tertiary sector														
	<table border="1"> <tr> <td>Intent:</td> <td>To reduce final energy consumptions in the tertiary sector</td> </tr> <tr> <td>Indicator:</td> <td>Energy consumed in the tertiary sector</td> </tr> <tr> <td>Unit of measure:</td> <td>ktep / employed</td> </tr> <tr> <td>Information sources:</td> <td>Consumption data provided by the distribution system operators or official statistics; employed in the sector from Unioncamere</td> </tr> <tr> <td>Assessment method:</td> <td>ktep consumed in tertiary sector / employed in tertiary sector; Calculation of the ratio</td> </tr> <tr> <td>Territorial Scale:</td> <td>All (difficult to estimate in small scale)</td> </tr> <tr> <td>Standards or references:</td> <td>Unioncamere (Chambers of Commerce Union),OECD, IEA, EUROSTAT, Energy Statistics Manual, 2005</td> </tr> </table>	Intent:	To reduce final energy consumptions in the tertiary sector	Indicator:	Energy consumed in the tertiary sector	Unit of measure:	ktep / employed	Information sources:	Consumption data provided by the distribution system operators or official statistics; employed in the sector from Unioncamere	Assessment method:	ktep consumed in tertiary sector / employed in tertiary sector; Calculation of the ratio	Territorial Scale:	All (difficult to estimate in small scale)	Standards or references:	Unioncamere (Chambers of Commerce Union),OECD, IEA, EUROSTAT, Energy Statistics Manual, 2005
Intent:	To reduce final energy consumptions in the tertiary sector														
Indicator:	Energy consumed in the tertiary sector														
Unit of measure:	ktep / employed														
Information sources:	Consumption data provided by the distribution system operators or official statistics; employed in the sector from Unioncamere														
Assessment method:	ktep consumed in tertiary sector / employed in tertiary sector; Calculation of the ratio														
Territorial Scale:	All (difficult to estimate in small scale)														
Standards or references:	Unioncamere (Chambers of Commerce Union),OECD, IEA, EUROSTAT, Energy Statistics Manual, 2005														
B.1.3	Final Energy consumption: residential sector														
	<table border="1"> <tr> <td>Intent:</td> <td>To reduce final energy consumptions in the residential sector</td> </tr> <tr> <td>Indicator:</td> <td>Energy consumed in the residential sector</td> </tr> <tr> <td>Unit of measure:</td> <td>ktep/mq ; ktep/inhabitant</td> </tr> <tr> <td>Information sources:</td> <td>Consumption data provided by the distribution system operators or official statistics; the surface of housing and the number of inhabitants comes from the competent public authorities</td> </tr> <tr> <td>Assessment method:</td> <td>Option 1: Verification of the final energy consumption by residential sector (ktep). Verification of the houses residential surface in the territory (mq). Calculation of the ratio between the final residential consumption and residential surface. Option 2: Verification of the final energy consumption by residential sector (ktep). Verification of the number of inhabitants living in the territory (n°). Calculation of the ratio between the final residential consumption and inhabitants.</td> </tr> <tr> <td>Territorial Scale:</td> <td>All</td> </tr> <tr> <td>Standards or references:</td> <td>OECD, IEA, EUROSTAT, Energy Statistics Manual, 2005</td> </tr> </table>	Intent:	To reduce final energy consumptions in the residential sector	Indicator:	Energy consumed in the residential sector	Unit of measure:	ktep/mq ; ktep/inhabitant	Information sources:	Consumption data provided by the distribution system operators or official statistics; the surface of housing and the number of inhabitants comes from the competent public authorities	Assessment method:	Option 1: Verification of the final energy consumption by residential sector (ktep). Verification of the houses residential surface in the territory (mq). Calculation of the ratio between the final residential consumption and residential surface. Option 2: Verification of the final energy consumption by residential sector (ktep). Verification of the number of inhabitants living in the territory (n°). Calculation of the ratio between the final residential consumption and inhabitants.	Territorial Scale:	All	Standards or references:	OECD, IEA, EUROSTAT, Energy Statistics Manual, 2005
Intent:	To reduce final energy consumptions in the residential sector														
Indicator:	Energy consumed in the residential sector														
Unit of measure:	ktep/mq ; ktep/inhabitant														
Information sources:	Consumption data provided by the distribution system operators or official statistics; the surface of housing and the number of inhabitants comes from the competent public authorities														
Assessment method:	Option 1: Verification of the final energy consumption by residential sector (ktep). Verification of the houses residential surface in the territory (mq). Calculation of the ratio between the final residential consumption and residential surface. Option 2: Verification of the final energy consumption by residential sector (ktep). Verification of the number of inhabitants living in the territory (n°). Calculation of the ratio between the final residential consumption and inhabitants.														
Territorial Scale:	All														
Standards or references:	OECD, IEA, EUROSTAT, Energy Statistics Manual, 2005														

B.1.4	Final Energy consumptions: industrial sector	
	Intent:	To reduce final energy consumptions in the industrial sector
	Indicator:	Energy consumed in the industrial sector
	Unit of measure:	ktep / employed
	Information sources:	Consumption data provided by the distribution system operators or official statistics; employed in the sector from Unioncamere
	Assessment method:	Calculation of the ratio ktep consumed in industrial sector / employed in industrial sector
	Territorial Scale:	All (difficult to estimate in small scale)
	Standards or references:	Unioncamere - Chambers of Commerce Union), OECD, IEA, EUROSTAT, Energy Statistics Manual, 2005
B.1.5	Final Energy consumptions: agricultural sector	
	Intent:	To reduce final energy consumptions in the agricultural sector
	Indicator:	Energy consumed in the agricultural sector
	Unit of measure:	ktep / employed
	Information sources:	Consumption data provided by the distribution system operators or official statistics; employed in the sector from Regional Statistical Office
	Assessment method:	Calculation of the ratio ktep consumed in agricultural sector / employed in agricultural sector
	Territorial Scale:	All (difficult to estimate in small scale)
	Standards or references:	OECD, IEA, EUROSTAT, Energy Statistics Manual, 2005
B.1.6	Final Energy consumptions: mobility	
	Intent:	To reduce final energy consumptions for mobility
	Indicator:	Energy consumed for mobility
	Unit of measure:	ktep / inhabitant
	Information sources:	Consumption data provided by the distribution system operators or official statistics; and the number of inhabitants comes from the competent public authorities
	Assessment method:	Calculation of the ratio ktep (a conversion is necessary for the various fuels) consumed in transport sector (only private mobility, it's difficult to calculate the contribution of public transport) / inhabitants (it is also necessary to calculate the equivalent inhabitants, as in the case of tourists)
	Territorial Scale:	All (difficult to estimate in small scale)
	Standards or references:	OECD, IEA, EUROSTAT, Energy Statistics Manual, 2005

B.1.7		Energy consumption of public buildings	
	Intent:	To reduce energy consumption	
	Indicator:	Energy consumption of public buildings over the total consumption in the territory	
	Unit of measure:	%	
	Information sources:	Statistic data	
	Assessment method:	Calculate the energy consumption of public buildings over the total consumption in the territory	
	Territorial Scale:	All	
	Standards or references:	Technical standard, Database of the national electricity grid, municipality guidelines	
B.1.8		Primary energy consumption	
	Intent:	To decrease the amount of consumed primary energy in the Alpine Space. To mitigate or defer global warming and avoid dangerous climate change.	
	Indicator:	Primary energy consumption per capita	
	Unit of measure:	kWh/inh.*a	
	Information sources:	Calculated data	
	Assessment method:	<p>The primary energy consumption per capita shall be calculated as the primary energy consumption in kWh/a caused by households, trade and commerce, industry and agriculture (numerator) divided by the territory's total population (denominator).</p> $\frac{\sum_{i=1}^4 \text{Primary energy consumption}_i \text{ [kWh/a]}}{\text{Territory's total population [inh.]}}$	
	Territorial Scale:	All	
	Standards or references:	European Environment Agency (EEA) (2017): Primary energy consumption by fuel. Available at https://www.eea.europa.eu/data-and-maps/indicators/primary-energy-consumption-by-fuel-6 (14.11.2017)	
B.1.9		Petroleum products sold	
	Intent:	Energy Saving and CO2 emissions reduction	
	Indicator:	Quantity of petroleum products sold	
	Unit of measure:	Tons/year	
	Information sources:	Statistic data by National Ministry	
	Assessment method:	Verification of final petroleum products sold in a year	
	Territorial Scale:	All	
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/uso-delle-risorse/energia_vendita-di-prodotti-petroliferi	

B.1.10	Electric Energy consumptions: tertiary sector	
	Intent:	To reduce energy consumption
	Indicator:	Average energy consumption per capita per year in tertiary sector
	Unit of measure:	MWh / employed in tertiary sector
	Information sources:	Data provided by the Manager of the national electricity grid, and Unioncamere for employed in tertiary sector; in the touristic areas you may need to take account of population equivalent
	Assessment method:	Calculation of energy consumption per capita per year in tertiary sector
	Territorial Scale:	All
	Standards or references:	Unioncamere (Chambers of Commerce Union), OECD, IEA, EUROSTAT, Energy Statistics Manual, 2005
B.1.11	Electric Energy consumption: residential sector	
	Intent:	To reduce energy consumption
	Indicator:	Average energy consumption per capita per year
	Unit of measure:	MWh / inhabitants
	Information sources:	Data provided by the Manager of the national electricity grid, municipality or other public administration for number of inhabitants; in the touristic areas you may need to take account of population equivalent
	Assessment method:	Calculation of the average energy consumption per capita per year
	Territorial Scale:	All
	Standards or references:	OECD, IEA, EUROSTAT, Energy Statistics Manual, 2005
B.1.12	Electric Energy consumptions: industrial sector	
	Intent:	To reduce energy consumption
	Indicator:	Average energy consumption per capita per year in industrial sector
	Unit of measure:	MWh / employed in industrial sector
	Information sources:	Data provided by the Manager of the national electricity grid, and Unioncamere for employed in industrial sector
	Assessment method:	Calculation of the average energy consumption per capita per year in industrial sector
	Territorial Scale:	All
	Standards or references:	Unioncamere (Chambers of Commerce Union), OECD, IEA, EUROSTAT, Energy Statistics Manual, 2005

B.1.13		Electric Energy consumptions: agricultural sector	
	Intent:	To reduce energy consumption	
	Indicator:	Average energy consumption per capita per year in agricultural sector	
	Unit of measure:	MWh / employed in agricultural sector	
	Information sources:	Data provided by the Manager of the national electricity grid, and Regional Statistical Office for employed in agricultural sector	
	Assessment method:	Calculate the average energy consumption per capita per year in agricultural sector	
	Territorial Scale:	All (difficult to estimate in small scale)	
	Standards or references:	Unioncamere (Chambers of Commerce Union), OECD, IEA, EUROSTAT, Energy Statistics Manual, 2005	
B.1.14		Electric Energy consumptions: mobility sector	
	Intent:	To reduce energy consumption	
	Indicator:	Energy consumption per charging points per year	
	Unit of measure:	MWh / charging points	
	Information sources:	Monitored data provided by the Regional platform for electric mobility	
	Assessment method:	Ratio between energy consumption (MWh) and number of charging points	
	Territorial Scale:	All	
	Standards or references:	Regional Electric Mobility Platform: http://www.regione.piemonte.it/trasporti/mobilitaElettrica.htm	
B.1.15		Electric Energy consumptions in urban areas	
	Intent:	To reduce energy consumption	
	Indicator:	Energy consumption per capita per year	
	Unit of measure:	Kwh /person year	
	Information sources:	Statistic data provided by the Manager of the national electricity grid, municipality	
	Assessment method:	Use of statistic data	
	Territorial Scale:	Large	
	Standards or references:	http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/uso-delle-risorse/energia_consumo-di-energia-elettrica	
B.1.16		Thermal energy consumption: private buildings	
	Intent:	To reduce energy consumption	
	Indicator:	Average thermal energy consumption per m2 in private buildings	
	Unit of measure:	kWh / m2	
	Information sources:	Data provided by the fuel distributors and local administration	
	Assessment method:	Conversion of the calorific value of all fuels in kWh and division with the total square meters of residential surfaces	
	Territorial Scale:	All	
	Standards or references:	OECD, IEA, EUROSTAT, Energy Statistics Manual, 2005	

B.1.17	Thermal energy consumption: public buildings	
	Intent:	To reduce energy consumption
	Indicator:	Average thermal energy consumption per m2 in public buildings
	Unit of measure:	kWh / m2
	Information sources:	Data provided by the fuel distributors and local administration
	Assessment method:	Conversion of the calorific value of all fuels in kWh and division with the total square meters of public buildings
	Territorial Scale:	All
	Standards or references:	OECD, IEA, EUROSTAT, Energy Statistics Manual, 2005
B.1.18	Thermal energy consumption: industrial buildings	
	Intent:	To reduce energy consumption
	Indicator:	Average thermal energy consumption per m2 in industrial buildings
	Unit of measure:	kWh / m2
	Information sources:	Data provided by the fuel distributors and local administration
	Assessment method:	Conversion of the calorific value of all fuels in kWh and division with the total square meters of industrial buildings
	Territorial Scale:	All
	Standards or references:	OECD, IEA, EUROSTAT, Energy Statistics Manual, 2005
B.1.19	Winter sports energy consumption	
	Intent:	To assess the impact of coping strategy of winter resorts
	Indicator:	Energy consumption of winter sports activities
	Unit of measure:	kWh/season
	Information sources:	Local authorities and managing companies
	Assessment method:	kWh of energy consumption for winter resorts activities (ski lift and artificial snow production)
	Territorial Scale:	Small
	Standards or references:	Regional energy and climate plan (SRCAE); local energy and climate plan (PCET)
B.1.20	Degree of renewable energy consumed	
	Intent:	To measure how extensive the use of renewable energy is
	Indicator:	Share of renewable energy in gross final energy consumption
	Unit of measure:	%
	Information sources:	Measured data
	Assessment method:	$\frac{\text{Renewable final energy consumption [kWh/a]}}{\text{Total final energy consumption [kWh/a]}} * 100$
	Territorial Scale:	All
	Standards or references:	UN global list of SDG indicators, EUROSTAT, Directive 2009/28/EC on the promotion of the use of energy from renewable sources, Statistic Institutes

B.1.21	Efficiency in energy use in existing residential buildings	
	Intent:	To promote an efficient energy use by the existing residential building stock
	Indicator:	Number of energy efficient buildings as a share of exiting residential building stock
	Unit of measure:	%
	Information sources:	Statistic data, Regional Data banks
	Assessment method:	Calculation of percentage of the numbers of energy efficient buildings in relationship with the exiting residential building stock
	Territorial Scale:	All
	Standards or references:	ISTAT (National Statistic Institute) for exiting residential building stock; Piedmont Region (energy efficiency classes to consider: A1, A2, A3, A4) for numbers of energy efficient buildings
B.1.21 bis	Efficiency in energy use in existing residential buildings	
	Intent:	To promote an efficient energy use by the existing residential building stock
	Indicator:	Number of energy efficient buildings as a share of energy certified residential building stock
	Unit of measure:	%
	Information sources:	Veneto Region, Direzione Ricerca innovazione ed energia, https://venet-energia-edifici.regione.veneto.it/VeNet/statistiche.php
	Assessment method:	Calculation of percentage of the numbers of energy efficient buildings (class B + class A or higher) in relationship with the number of certified residential building
	Territorial Scale:	All
	Standards or references:	Decreto 26 giugno 2015: Adeguamento del Decreto del Ministro dello Sviluppo Economico, 26 giugno 2009
B.1.22	Efficiency in energy use in existing non residential buildings	
	Intent:	To promote an efficient energy use by the existing non residential building stock
	Indicator:	Number of energy efficient buildings as a share of exiting not residential building stock
	Unit of measure:	%
	Information sources:	Statistic data, Regional Data banks
	Assessment method:	Calculation of percentage of the numbers of energy efficient buildings in relationship with exiting not residential building stock
	Territorial Scale:	All
	Standards or references:	ISTAT (National Statistic Institute) for exiting non residential building stock; Piedmont Region (energy efficiency classes to consider: A1, A2, A3, A4) for numbers of energy efficient buildings

B.1.22 bis	Efficiency in energy use in existing non residential buildings	
	Intent:	To promote an efficient energy use by the energy certified non residential building stock
	Indicator:	Number of energy efficient buildings as a share of energy certified not residential buildings
	Unit of measure:	%
	Information sources:	https://venet-energia-edifici.regione.veneto.it/VeNet/statistiche.php
	Assessment method:	Calculation of percentage of energy efficient buildings (class B + class A or higher) on certified (with APE) not residential building stock (for building we intend the certified units, not all the construction; we consider only subjected commercial and directional units). In the construction of the data only the buildings with APE, the energy performance certificate, are taken into consideration (sum of 2015-last years)
	Territorial Scale:	All
Standards or references:	Decreto 26 giugno 2015: Adeguamento del Decreto del Ministro dello Sviluppo Economico, 26 giugno 2009	
B.1.23	Energy certified building stock	
	Intent:	To encourage energy certification (APE) of households
	Indicator:	Share of energy certified households (with APE) on total households
	Unit of measure:	%
	Information sources:	Veneto Region, Direzione Ricerca innovazione ed energia, https://venet-energia-edifici.regione.veneto.it/VeNet/statistiche.php
	Assessment method:	Calculate (number of assessed households / total number of households) * 100
	Territorial Scale:	All
Standards or references:	Decreto 26 giugno 2015: Adeguamento del Decreto del Ministro dello Sviluppo Economico, 26 giugno 2009	
B.1.24	Energy Shift in progress	
	Intent:	To measure the changes in mind-set and behaviour of inhabitants concerning their shift in behaviour patterns and habits
	Indicator:	activities/yr
	Unit of measure:	n
	Information sources:	Regiomanagement, Teamstaff from mayor. This criterion is considered as an experiment only. It might be changed in the next period. However, it is just to find out if it is possible to describe and understand social trends such as this at all.
	Assessment method:	Survey: asking the regiomanagement how many activities took place in on period
	Territorial Scale:	Small and large scale
Standards or references:	No standards	

B2 SUSTAINABLE ENERGY															
B.2.1	Renewable energy locally produced														
	<table border="1"> <tr> <td>Intent:</td> <td>To assess the level of renewable energy production compared to the consumption and then the level of 'autonomy' of the territory.</td> </tr> <tr> <td>Indicator:</td> <td>Option1: RES production (kWh/year) compared to global energy consumption (final kWh/year) Option2: Total RE produced as % of the total energy demand / self-sufficiency</td> </tr> <tr> <td>Unit of measure:</td> <td>%</td> </tr> <tr> <td>Information sources:</td> <td>Measured data</td> </tr> <tr> <td>Assessment method:</td> <td>Collection of data established with official calculation method for RES production and energy consumption Option 1: - Collection of data established with official calculation method for RES production and energy consumption. - Calculation of the ratio between RES production (kWh/year) and global energy consumption (final kWh/year) Option 2: Calculation of the ratio between total RE produced AND total energy demand / self-sufficiency</td> </tr> <tr> <td>Territorial Scale:</td> <td>Large</td> </tr> <tr> <td>Standards or references:</td> <td>OREGES, SNDD, SOEs, CLER TEPOS (French network for the energy transition, Working group for positive energy territories), SEAP ALPS, French Regional observatory of energy consumption and GES emissions</td> </tr> </table>	Intent:	To assess the level of renewable energy production compared to the consumption and then the level of 'autonomy' of the territory.	Indicator:	Option1: RES production (kWh/year) compared to global energy consumption (final kWh/year) Option2: Total RE produced as % of the total energy demand / self-sufficiency	Unit of measure:	%	Information sources:	Measured data	Assessment method:	Collection of data established with official calculation method for RES production and energy consumption Option 1: - Collection of data established with official calculation method for RES production and energy consumption. - Calculation of the ratio between RES production (kWh/year) and global energy consumption (final kWh/year) Option 2: Calculation of the ratio between total RE produced AND total energy demand / self-sufficiency	Territorial Scale:	Large	Standards or references:	OREGES, SNDD, SOEs, CLER TEPOS (French network for the energy transition, Working group for positive energy territories), SEAP ALPS, French Regional observatory of energy consumption and GES emissions
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Unit of measure:	MWh / km ² ; TEP/Km ² ; TEP/inhabitant														
Information sources:	Statistic data														
Assessment method:	Calculate the total amount of power produced by wind in the area														
Territorial Scale:	All														
Standards or references:	Database of the manager of the national electricity grid, municipality guidelines														
B.2.3	Production Power by Water														
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Intent:	To improve the share of renewable energy														
Indicator:	Total amount of power produced by water														
Unit of measure:	MWh / km ² ; TEP/Km ² ; TEP/inhabitant														
Information sources:	Statistic data														
Assessment method:	Calculate the total amount of power produced by water in the area														
Territorial Scale:	All														
Standards or references:	Database of the manager of the national electricity grid, municipality guidelines														

B.2.4	Heat by Biomass	
	Intent:	To improve the share of renewable energy
	Indicator:	Total amount of heat produced by biomass
	Unit of measure:	MWh / km ² ; TEP/Km ² ; TEP/inhabitant
	Information sources:	Statistic data
	Assessment method:	Calculate the total amount of power produced by biomass in the area
	Territorial Scale:	All
	Standards or references:	
B.2.5	Heat by solar thermal sources	
	Intent:	To improve the share of renewable energy
	Indicator:	Total amount of heat produced by sun
	Unit of measure:	MWh / km ²
	Information sources:	Statistic data
	Assessment method:	Calculate the total amount of power produced by sun in the area
	Territorial Scale:	All
	Standards or references:	Database of the manager of the national heating grid, municipality guidelines
B.2.6	Heat by geothermal sources	
	Intent:	To improve the share of renewable energy
	Indicator:	Total amount of heat produced by geothermal sources
	Unit of measure:	MWh / km ²
	Information sources:	Statistic data
	Assessment method:	Calculate the total amount of power produced by geothermal sources in the area
	Territorial Scale:	All
	Standards or references:	Database of the manager of the national heating grid, municipality guidelines
B.2.7	Energetic balance of primary energy	
	Intent:	To evaluate energy self-sufficiency
	Indicator:	Percentage of exported energy in relationship with imported energy
	Unit of measure:	%
	Information sources:	Statistic data provided by Manager of the national electricity grid
	Assessment method:	Use of statistic data
	Territorial Scale:	All
	Standards or references:	Piedmont Region - Energetic Regional Plan: http://www.regione.piemonte.it/energia/pianoEnergyReg.htm ENEA (Italian national Agency for new technologies, energy and sustainable economic development)

B.2.8		PV production	
	Intent:	To assess the level of PV electricity production	
	Indicator:	PV electricity production	
	Unit of measure:	kWh/year	
	Information sources:	Monitoring and statistic data	
	Assessment method:	Calculate the PV production with a collection of data established with official calculation method and units	
	Territorial Scale:	Large	
	Standards or references:	OREGES, Indicateurs du DD pour les territoires SNDD, SOEs, SEAP ALPS	
B.2.9		Biogas production	
	Intent:	To assess the level of biogas production	
	Indicator:	Biogas production	
	Unit of measure:	kWh/year	
	Information sources:	Monitoring and statistic data	
	Assessment method:	Calculate the biogas production with a collection of data established with official calculation method and units	
	Territorial Scale:	Large	
	Standards or references:	OREGES, Indicators SNDD, SOEs, SEAP ALPS	
B.2.10		Energy productivity	
	Intent:	To promote efficient energy systems able to reduce the energy used to provide services and products	
	Indicator:	Amount of economic output that is produced per unit of energy used	
	Unit of measure:	€ / kg of oil equivalent	
	Information sources:	Statistic data	
	Assessment method:	<p>The indicator results from the division of the gross domestic product (GDP) by the gross inland consumption of energy for a given calendar year. It measures the productivity of energy consumption</p> <p>For the calculation of energy productivity Eurostat uses the GDP either in the unit of EUR in chain-linked volumes to the reference year 2010 at 2010 exchange rates or in the unit PPS (Purchasing Power Standard). The unit EUR in chain linked volumes allows observing the energy productivity trends over time in a single geographic area, whereas the unit PPS allows to compare countries for the same year. The gross inland consumption of energy is calculated as the sum of the gross inland consumption of five energy types: coal, electricity, oil, natural gas and renewable energy sources. Since GDP is measured in million EUR or million PPS and gross inland consumption in thousand tonnes of oil equivalent, energy productivity is available in both EUR per kg of oil equivalent and PPS per kg of oil equivalent.</p>	
	Territorial Scale:	Large	
	Standards or references:	UN global list of SDG indicators, EUROSTAT (online data code: t2020_rd310) http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&pcode=t2020_rd310&language=en	

B3		WATER CONSUMPTION	
B.3.1	Consumption of water		
	Intent:	To reduce water consumptions for all uses	
	Indicator:	Consumption of water per capita	
	Unit of measure:	m ³ /inh.*a	
	Information sources:	Calculated data	
	Assessment method:	$\frac{\text{Household water consumption [m}^3\text{/a]}}{\text{Territory's total population [inh.]}}$	
	Territorial Scale:	Large	
	Standards or references:	Agenzia Regionale per la Protezione Ambientale (2016): Acqua consumo acqua potabile. Available at https://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/componenti-ambientali/acqua_consumo-acqua-potabile (13.07.2017). ISO 37120: 2014-05: Sustainable development of communities – Indicators for city services and quality of life (2014-05)	
B.3.2	Consumption of water – Human uses		
	Intent:	To reduce water consumptions for human uses	
	Indicator:	Annual water consumption per inhabitant	
	Unit of measure:	m ³ /inhabitant year	
	Information sources:	Statistic data	
	Assessment method:	Use of statistic data Calculation of the ratio between water consumption (human use) (m ³) and the number of inhabitants (m ³ /inhabitant year)	
	Territorial Scale:	Large	
	Standards or references:	https://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/componenti-ambientali/acqua_consumo-acqua-potabile ISTAT (National Institute for statistic)	
B.3.3	Consumption of water for Agriculture– Non human uses		
	Intent:	To reduce water consumptions in Agriculture	
	Indicator:	Annual water consumption per Km ² of agricultural areas	
	Unit of measure:	m ³ /Km ²	
	Information sources:	Measured data	
	Assessment method:	Calculate water consumed for the irrigation of areas intended for Agriculture purposes	
	Territorial Scale:	All	
	Standards or references:	ISTAT, https://www.istat.it/it/files/2014/11/Utilizzo_risorsa_idrica.pdf	

B.3.4	Winter sports water consumption	
	Intent:	To assess the impact of coping strategy of winter resorts
	Indicator:	Water consumption of winter sports activities
	Unit of measure:	m3 /season
	Information sources:	Local authorities and managing companies
	Assessment method:	Calculate the total m3 of water consumed for the production of artificial snow
	Territorial Scale:	Small
	Standards or references:	Regional energy and climate plan (SRCAE); local energy and climate plan (PCET)
B.3.5	Consumption of water for industry - non human uses	
	Intent:	To reduce water consumption by industry
	Indicator:	Daily water consumption by industry
	Unit of measure:	m3/working day
	Information sources:	Measured data
	Assessment method:	Calculate water consumed by the industrial sector per year in cubic metres divided by the total number of working days
	Territorial Scale:	All
	Standards or references:	Environment Statistics, Office of Statistics, National Government of Liechtenstein

B4		LAND AND BUILDING STOCK USE	
B.4.1	Efficiency in the use of existing residential building		
	Intent:	To promote an efficient use of the existing residential building stock	
	Indicator:	Ratio between the total estimated area of not occupied residential buildings and the total area of residential buildings in the territory	
	Unit of measure:	%	
	Information sources:	Measured data	
	Assessment method:	$\frac{\text{Number of Vacant dwellings}}{\text{Total number of dwellings [m}^2\text{]}} * 100$	
	Territorial Scale:	Small	
	Standards or references:	Bayerische Verwaltung für ländliche Entwicklung (2016): Vitalitäts-Check 2.1. Das Analyseinstrument zur Innenentwicklung für Dörfer und Gemeinden. Available at http://www.stmelf.bayern.de/landentwicklung/dokumentationen/05178/index.php?layer=rss (13.07.2017). U.S: Green building council (USGBC) (2013): LEED 2009 for Neighborhood Development Rating System. Updated October 2013. GIB Credit 5: Existing Building Reuse	
B.4.2	Efficiency in the use of existing non residential building		
	Intent:	To promote an efficient use of the existing non residential building stock	
	Indicator:	Ratio between the total estimated area of not occupied non residential buildings and the total area of non residential buildings in the territory	
	Unit of measure:	%	
	Information sources:	Measured data	
	Assessment method:	$\frac{\text{Vacant floor area of non-residential buildings [m}^2\text{]}}{\text{Total floor area of non-residential buildings [m}^2\text{]}} * 100$	
	Territorial Scale:	Small	
	Standards or references:	Bayerische Verwaltung für ländliche Entwicklung (2016): Vitalitäts-Check 2.1. Das Analyseinstrument zur Innenentwicklung für Dörfer und Gemeinden. Available at http://www.stmelf.bayern.de/landentwicklung/dokumentationen/05178/index.php?layer=rss (13.07.2017)	
B.4.3	Artificial land consumption		
	Intent:	To reduce land consumption	
	Indicator:	Urbanized area	
	Unit of measure:	%	
	Information sources:	Calculated data	
	Assessment method:	Calculate the total artificial area with its subunits of total built-up area and total artificial non-built-up area divided by the total area	
	Territorial Scale:	All	
	Standards or references:	EUROSTAT, ISPRA; Lucas; SIMON – Systema Informativo Monitoraggio PGT - Monitoring Informatic System for Territorial Governance Plans of Lombardy Municipalities, Data provided by municipalities - Corine Land Cover	

B.4.4	Consumption of soil resulting from sealing	
	Intent:	To reduce land consumption
	Indicator:	Sealed area
	Unit of measure:	%
	Information sources:	Statistic data provided by municipalities
	Assessment method:	It considers the areas with sealed soil for an evaluation of compromission of ecological function of the soil: Sealed area / total area
	Territorial Scale:	All
	Standards or references:	Corine Land Cover; ISPRA (National Institute for Environmental Protection and Research – Italy): http://www.sinanet.isprambiente.it/it/sia-ispra/download-mais/consumo-di-suolo/dati-nazionali-regionali-provinciali-e-comunali Lucas; SIMON – Systema Informativo Monitoraggio PGT - Monitoring Informatic System for Territorial Governance Plans of Lombardy Municipalities (LOMBARDIA)
B.4.5	Level of settlement	
	Intent:	To measure the attractiveness as living location
	Indicator:	Average number of dwellings per km ²
	Unit of measure:	\sum dwelling / km ²
	Information sources:	Measured data
	Assessment method:	Option 1: Addition of all dwellings of the geographical area and calculate the sum Option 2: Divide through the number of km ² the geographical area has
	Territorial Scale:	All
	Standards or references:	Bayerische Verwaltung für Ländliche Entwicklung - Vitalitäts-Check 2.0 zur Innenentwicklung für Dörfer und Gemeinden Leitfadens
B.4.6	Intensity of land use	
	Intent:	To reduce land consumption
	Indicator:	Intensity of land use
	Unit of measure:	m ² /inhabitant
	Information sources:	Measured data
	Assessment method:	$\frac{\text{Urbanized area [m}^2\text{]}}{\text{Territory's total population [inh.]}}$
	Territorial Scale:	All
	Standards or references:	Barbano, G., Eßig, N., Mittermeier, P., Orova, M., Beagon, P., Claudi, L., Gomez-Salcedo, J. & Kiedaisch, F. (2016): NewTREND. Deliverable D2.2 Definition of sustainable key performance indicators. European Environment Agency (EEA) (2017): Land take. Available at https://www.eea.europa.eu/data-and-maps/indicators/land-take-2/assessment-1 (22.06.2017).

B.4.7	Vulnerability of agricultural soil	
	Intent:	To reduce the impact on agricultural system
	Indicator:	Fertile soil consumption
	Unit of measure:	%
	Information sources:	Statistic data
	Assessment method:	Calculate the surface of fertile soil consumed over the total area. Assess how new urbanisations subtract soils useful to agricultural production, evaluated by land capability classification (I, II, III classes of land capability)
	Territorial Scale:	all
	Standards or references:	ERSA, Territorial Regional Plan, Piedmont Region - Monitoring soil Consumption: http://www.regione.piemonte.it/territorio/pianifica/sostenibilita.htm
B.4.8	Urbanized area	
	Intent:	To reduce land consumption
	Indicator:	Urbanized area
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	Calculate the ratio between the areas already built (different from natural or agricultural soil) and total municipal area
	Territorial Scale:	All
	Standards or references:	ISPRA; Lucas; SIMON – Systema Informativo Monitoraggio PGT - Monitoring Informatic System for Territorial Governance Plans of Lombardy Municipalities
B.4.9	Urbanisable area	
	Intent:	To reduce land consumption
	Indicator:	Urbanisable area
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	Calculate the sum of areas with new urbanization previsions foreseen in Municipal Urban Plan which are not already built and total municipal area
	Territorial Scale:	All
	Standards or references:	Regional law 31/2014, Territorial Regional Plan of Lombardy, SIMON – Systema Informativo Monitoraggio PGT - Monitoring Informatic System for Territorial Governance Plans of Lombardy Municipalities

B.4.10	Sprawl	
	Intent:	To reduce land consumption
	Indicator:	Urbanized dispersion index
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	Calculate the following formula $(SUD + SUR / SU) * 100$ where: SUD = Discontinuous urbanized area (mq) SUR = Surface scattered urbanisation (mq) SU = total urbanized area (mq)
	Territorial Scale:	All
	Standards or references:	Lucas; Territorial Regional Plan, Piedmont Region - Monitoring soil Consumption: http://www.regione.piemonte.it/territorio/pianifica/sostenibilita.htm ISPRA (National Institute for Environmental Protection and Research – Italy): http://www.sinanet.isprambiente.it/it/sia-ispra/download-mais/consumo-di-suolo/dati-nazionali-regionali-provinciali-e-comunali
B.4.11	Land consumption	
	Intent:	To reduce land consumption
	Indicator:	Land consumption
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	Calculate the ratio between the sum of Urbanized area and Urbanisable area over the total municipal area
	Territorial Scale:	All
	Standards or references:	Regional law 31/2014, Territorial Regional Plan of Lombardy, SIMON – Systema Informativo Monitoraggio PGT - Monitoring Informatic System for Territorial Governance Plans of Lombardy Municipalities
B.4.12	Impact area of land use	
	Intent:	To reduce land consumption
	Indicator:	Impact area of land use
	Unit of measure:	%
	Information sources:	Monitored and estimated data provided by Region / Municipalities
	Assessment method:	Calculate the impact of area already built (different from natural or agricultural soil) to assess the compromission of the territory. Verification of the urbanized area (ha) with a buffer. Verification of territorial area (ha). Calculation urbanized area as a share of total area.
	Territorial Scale:	All
	Standards or references:	Piedmont Region - Monitoring soil Consumption: http://www.regione.piemonte.it/territorio/pianifica/sostenibilita.htm

B.4.13	Land consumption by infrastructures	
	Intent:	To reduce land consumption
	Indicator:	Land consumption by infrastructures
	Unit of measure:	%
	Information sources:	Monitored and estimated data provided by Region / Municipalities
	Assessment method:	Calculate infrastructure area. Verification of territorial area (ha). Calculation land consumption by infrastructure area as a share of total area.
	Territorial Scale:	All
	Standards or references:	Piedmont Region - Monitoring soil Consumption: http://www.regione.piemonte.it/territorio/pianifica/sostenibilita.htm
B.4.14	Index of reversible soil consumption	
	Intent:	To reduce land consumption
	Indicator:	Reversible soil consumption
	Unit of measure:	%
	Information sources:	Monitored and estimated data provided by Region / Municipalities
	Assessment method:	Assess land consumption due to the reversible uses (quarries, urban parks, sports facilities, photovoltaic plants ...) within a given territory. Calculate the reversible soil consumption area (ha) . Verification of territorial area (ha). Calculation reversible soil consumption area as a share of total area
	Territorial Scale:	All
	Standards or references:	Piedmont Region - Monitoring soil Consumption: http://www.regione.piemonte.it/territorio/pianifica/sostenibilita.htm
B.4.15	Index of total soil consumption	
	Intent:	To reduce land consumption
	Indicator:	Total soil consumption
	Unit of measure:	%
	Information sources:	Monitored and estimated data provided by Region / Municipalities
	Assessment method:	Assess total land consumption (sum of urbanized area, infrastructural area, reversible soil consumption area). Calculate the urbanized area, the infrastructural area, the reversible soil consumption area. Sum the urbanized area, the infrastructural area, the reversible soil consumption area.(ha). Verification of territorial area (ha). Calculation total soil consumption area as a share of total area.
	Territorial Scale:	All
	Standards or references:	Piedmont Region - Monitoring soil Consumption: http://www.regione.piemonte.it/territorio/pianifica/sostenibilita.htm

B.4.16	Recycled share of construction waste	
	Intent:	To promote further use and renovation of buildings instead of demolition. To encourage selective deconstruction instead of conventional demolition. To support high quality recycling of building materials at the end of the life cycle
	Indicator:	Percentage of recycled construction waste
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	$\frac{\text{Amount of recycled construction waste [t]}}{\text{Total amount of construction waste [t]}} * 100$
	Territorial Scale:	All
	Standards or references:	European Environment Agency (EEA) (2010): The European Environment State and outlook 2010. Material resources and waste. Copenhagen. VDI. Zentrum Ressourceneffizienz (2017): Ressourceneffizienz im Bauwesen. Available at https://www.ressource-deutschland.de/themen/bauwesen/?L=0 (28.08.2017)
B.4.17	Building renovation rate	
	Intent:	To encourage the renovation of buildings to a certain energy standard
	Indicator:	Share of buildings renovated in a given year to a certain energy standard
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	Calculate number of buildings renovated in a year to a stipulated energy standard/ total of number of buildings in the territory * 100
	Territorial Scale:	All
	Standards or references:	Berichte und Anträge (BuA) der Regierung an den Landtag Liechtenstein
B.4.18	Demolition of degraded buildings	
	Intent:	Evaluating urban reuse / renewal policies
	Indicator:	Degraded buildings demolished
	Unit of measure:	%
	Information sources:	Municipal data bank; Direzione Regionale Pianificazione Territoriale - UO Urbanistica
	Assessment method:	Calculation of the percentage of the volume demolished on the total volume of the buildings declared degraded
	Territorial Scale:	All
	Standards or references:	Veneto Region, Regional Law 14/2017 and subsequent amendments and additions

6.3 C- INFRASTRUCTURES/SERVICES

C1		MOBILITY	
C.1.1	Access to public transportation		
	Intent:	To measure the development of public transportation	
	Indicator:	Number of public transport stops in the territory	
	Unit of measure:	Number; number per km ²	
	Information sources:	Calculated data	
	Assessment method:	Option 1: Calculate the number of public transport stops Option 2: Calculate the density of public transport stops in the area	
	Territorial Scale:	All	
	Standards or references:	Maps of public transportation, Deutsche Gesellschaft Nachhaltiges Bauen - Nutzungsprofil Büro und Verwaltungsgebäude	
C.1.2	Performance of the public transport		
	Intent:	To improve accessibility to public transportation	
	Indicator:	Number of public transport stops in the area	
	Unit of measure:	Number of stops/km ²	
	Information sources:	Calculated data	
	Assessment method:	$\frac{\text{Number of public transport stops}}{\text{Territory's urbanized area [Km}^2\text{]}}$	
	Territorial Scale:	All	
	Standards or references:	Bayerische Verwaltung für ländliche Entwicklung (2016): Ländliche Entwicklung in Bayern. Planen mit System. Vitalitäts-Check zur Innenentwicklung für Dörfer und Gemeinden. Leitfaden. Available at http://www.stmelf.bayern.de/landentwicklung/dokumentationen/059178/index.php?layer=rss (13.07.2017). European Environment Agency (EEA) (2016): CO2 emissions from passenger transport. Available at https://www.eea.europa.eu/media/infographics/co2-emissions-from-passenger-transport/view (30.10.2017).	
C.1.3	Quality of walkways for pedestrian use		
	Intent:	To assess the extent and quality of walkways for occupants and users	
	Indicator:	Type and extent of secured walkways in the project (walkways sheltered from rain, snow or excess sunshine, etc.)	
	Unit of measure:	Number and Extension	
	Information sources:	Measured data	
	Assessment method:	Through a desk analysis evaluate the typology and extent of secured walkways	
	Territorial Scale:	All	
	Standards or references:	SBTool iisBE International	

C.1.4	Car ownership	
	Intent:	To reduce the number of cars
	Indicator:	Number of personal automobiles
	Unit of measure:	car/person
	Information sources:	Statistic data
	Assessment method:	Calculate the number of personal automobiles for inhabitants
	Territorial Scale:	All
	Standards or references:	Automobile Public Register, Public Car record Book of the municipalities
C.1.5	Transport on demand service	
	Intent:	To decrease the use of individual car
	Indicator:	Number of existing lines
	Unit of measure:	Number
	Information sources:	Calculated data
	Assessment method:	Calculate the sum of the existing lines
	Territorial Scale:	Small
	Standards or references:	Study from State agency CEREMA, local authorities responsible for transport organisation and non for profit organisation of the social sector organising transport on demand service
C.1.6	Electricity dispensing systems	
	Intent:	Increase services for inhabitants
	Indicator:	Electricity dispensing systems
	Unit of measure:	Number/km2
	Information sources:	Measured data
	Assessment method:	Calculate the number of electricity dispensing systems in the analysed area
	Territorial Scale:	All
	Standards or references:	Open Data Lombardia, Economic development General Direction
C.1.7	Methane fuel dispensing systems	
	Intent:	Increase services for inhabitants
	Indicator:	Methane fuel dispensing systems
	Unit of measure:	Number; number/inhabitants; number/km2
	Information sources:	Open Data Lombardia
	Assessment method:	Option 1: Calculate the number of methane fuel dispensing systems for vehicles for public use Option 2: Calculate the number of methane fuel dispensing systems for vehicles per inhabitants Option 3: Calculate the number of methane fuel dispensing systems for vehicles per area
	Territorial Scale:	All
	Standards or references:	Open Data Lombardia, Economic development General Direction

C.1.8	Number of dispensing systems	
	Intent:	Increase services for inhabitants
	Indicator:	Fuel dispensing systems
	Unit of measure:	Number; number/inhabitants; number/km2
	Information sources:	Open Data Lombardia
	Assessment method:	Option 1: Calculate the number of fuel dispensing systems Option 2: Calculate the number of fuel dispensing systems per inhabitants Option 3: Calculate the number of fuel dispensing systems per area
	Territorial Scale:	All
	Standards or references:	Regione Lombardia, Economic development General Direction
C.1.9	Road Safety	
	Intent:	To assess the Plan's ability to help reduce accident rates through rationalization forecasts, upgrading and safety of the road network delegated to provincial and local plans
	Indicator:	Recognition in the five years of monitoring, of the number of road accidents, by measuring the change in the number of traffic accidents in reference to the regional territory
	Unit of measure:	n ; n/km ; n/inhabitants
	Information sources:	Monitored data
	Assessment method:	Evaluate data processing in the monitoring five year period
	Territorial Scale:	All
	Standards or references:	Data from the Regional Road Safety Monitoring Center
C.1.9 bis	Road Safety	
	Intent:	To assess the Plan's ability to help reduce accident rates through rationalization forecasts, upgrading and safety of the road network delegated to provincial and local plans
	Indicator:	Annual injury rate
	Unit of measure:	%
	Information sources:	Regional Road Safety Monitoring Center
	Assessment method:	Annual injury rate (dead + injured in road accidents / inhabitants)
	Territorial Scale:	All
	Standards or references:	Data from the Regional Road Safety Monitoring Center

C.1.10	Linear infrastructures for mobility	
	Intent:	To promote a sustainable mobility
	Indicator:	Linear development of roads and railway network
	Unit of measure:	Km
	Information sources:	Data banks
	Assessment method:	Verification of Km of roads and railways in a provincial area
	Territorial Scale:	Large
	Standards or references:	State of Environment Report and Environmental Indicators - ARPA Piemonte: http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/uso-delle-risorse/trasporti_infrastrutture-lineari-di-trasporto
C1.11	Modal split of public transport	
	Intent:	To determine ratio of public transport to other motorised forms of transport
	Indicator:	Modal split of public passenger transport
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	$\frac{\text{Distance travelled by public transport [pkm]}}{\text{Total distance travelled [pkm]}} * 100$
	Territorial Scale:	All
	Standards or references:	European Environment Agency (EEA) (2016): CO2 emissions from passenger transport. Available at https://www.eea.europa.eu/media/infographics/co2-emissions-from-passenger-transport/view (30.10.2017). Eurostat (2015): Sustainable development in the European Union. 2015 monitoring report of the EU Sustainable Development Strategy. Available at http://ec.europa.eu/eurostat/documents/3217494/6975281/KS-GT-15-001-EN-N.pdf/5a20c781-e6e4-4695-b33d-9f502a30383f (30.10.2017)
C1.11 bis	Modal split of public transport	
	Intent:	To determine ratio of public transport to other motorised forms of transport
	Indicator:	Modal split of public passenger transport
	Unit of measure:	%
	Information sources:	ISTAT Census, Municipal analysis
	Assessment method:	Calculate the percentage share of the public mode of transport in total inland transport, considering "systematic mobility" (daily movements for study or work) that use buses, coaches and trains on total of daily movements for study or work.
	Territorial Scale:	All
	Standards or references:	ISTAT Census

C1.12	Critical infrastructures	
	Intent:	To reduce the number of critical infrastructures
	Indicator:	Number of critical infrastructures
	Unit of measure:	Number
	Information sources:	Data available from Regions
	Assessment method:	Calculate the number of critical infrastructures. They are essential elements for the maintenance of vital functions of society, health, safety and economic and social welfare of citizens. Their disruption or destruction would have a significant impact due to a failure to maintain these functions
	Territorial Scale:	All
	Standards or references:	COUNCIL DIRECTIVE 2008/114/EC
C.1.13	Car sharing	
	Intent:	To decrease the use of individual car
	Indicator:	Number of car sharing users or share in total journeys
	Unit of measure:	%; number
	Information sources:	Calculated data
	Assessment method:	Option 1: Calculate the sum of car shared journeys over the total number of journeys Option2: Calculate the number of car shared journeys
	Territorial Scale:	Small to medium
	Standards or references:	Local authorities responsible for transport organisation and non for profit organisation of the social sector organising transport on demand service
C.1.14	Social tariff and gratuity and free of charge transportation	
	Intent:	To ease the access to public transports
	Indicator:	Existence of social tariff
	Unit of measure:	Number
	Information sources:	Calculated data
	Assessment method:	Sum of social tariffs or free of charge options
	Territorial Scale:	All
	Standards or references:	Study on transports (plan de déplacements in France), local authorities responsible for transport organisation

C.1.15	Share of electric mobility	
	Intent:	To promote electric mobility. To reduce emission of greenhouse and other harmful gases through vehicle traffic
	Indicator:	Percentage of electric vehicles
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	Calculate (number of registered electric vehicles / number of registered vehicles) *100
	Territorial Scale:	All
	Standards or references:	Deutsche Gesellschaft für nachhaltiges Bauen e.V. (DGNB) (2012): Neubau Stadtquartiere. DGNB Handbuch für nachhaltiges Bau en. Version 2012
C.1.16	Sustainable touristic mobility for cultural goods	
	Intent:	To track and improve the use of traffic reducing, environmentally-friendly (soft mobility)
	Indicator:	Percentage of tourists and same day visitors using local/soft mobility/public transport services to get around the destination (territorial area)
	Unit of measure:	%
	Information sources:	Transportation reports, Visitor Survey
	Assessment method:	<p>Calculate the total number of tourists and same day visitors using local/soft mobility/public transport services to get around the destination</p> <p>Calculate the total number of tourists and same day visitors</p> <p>Calculate the total number of tourists and same day visitors using local/soft mobility/public transport services to get around the destination ÷ total number of tourists and same day visitors * 100 = % of tourists and same day visitors using local/soft mobility/public transport services to get around the destination</p>
	Territorial Scale:	All
	Standards or references:	EU, European Tourism Indicators System for sustainable destination management http://ec.europa.eu/growth/sectors/tourism/offer/sustainable/indicators_it

C1.17	Public transport demand	
	Intent:	To measure the public transportation demand and efficiency
	Indicator:	Occupancy rate on total capacity of the public transport lines
	Unit of measure:	%
	Information sources:	Transport enterprises
	Assessment method:	Occupancy rate on total capacity of the public transport lines (Annual number of passenger of public transport on total capacity of public transport)
	Territorial Scale:	All
	Standards or references:	ISTAT Statistic Glossary
C.1.18	Cycling pathways	
	Intent:	Improve cycling in cities and suburban areas
	Indicator:	Cycling pathways in the area
	Unit of measure:	Km/Inhabitants
	Information sources:	Calculated data on Municipal data bank
	Assessment method:	Calculate the sum of continuous kilometres of cycling routes over inhabitants (1 km of unidirectional cycling pathway is counted as 0.5 Km)
	Territorial Scale:	all
	Standards or references:	National and local law
C.1.19	Access to commonly used services	
	Intent:	Increase services for inhabitants
	Indicator:	Average time to access services closer to home
	Unit of measure:	Minutes
	Information sources:	Statistical data
	Assessment method:	Calculate the average time needed to access services closer to home
	Territorial Scale:	All
	Standards or references:	Official statistics data bases

C2		LEISURE SERVICES	
C.2.1	Free time facilities		
	Intent:	To measure the provided local amenities	
	Indicator:	Number of youth clubs/association	
	Unit of measure:	Number	
	Information sources:	Measured data	
	Assessment method:	Information office of the municipality, maps (\sum youth clubs-association / number of youth (0-18 years) * 1000	
	Territorial Scale:	All	
	Standards or references:	Bayerische Verwaltung für Ländliche Entwicklung - Vitalitäts-Check 2.0 zur Innenentwicklung für Dörfer und Gemeinden Leitfaden	
C.2.2	Leisure- and recreation-space for settlement area		
	Intent:	To monitor how much near-natural recreation area is provided for the people	
	Indicator:	Area of developed near-natural recreation space	
	Unit of measure:	ha developed near-natural recreation area / 1,000 inhabitants	
	Information sources:	Calculated data	
	Assessment method:	Calculate the sum of the area (ha) for footpaths in forests and on meadows plus the area for public garden and lawn etc. etc. (all public and developed space surrounded by nature) divided by the number of thousand inhabitants of the municipality (2,400 people = 2.4 thousand people)	
	Territorial Scale:	Medium	
	Standards or references:	https://www.lustat.ch/indikatoren/taedtevergleich/kultur-und-freizeit/erholungsraum Municipal zoning plan, municipality statistic Institute	
C.2.2 bis	Leisure- and recreation-space for settlement area		
	Intent:	To monitor how much sport and near-natural recreation area is provided for the people	
	Indicator:	Area of developed near-natural recreation space	
	Unit of measure:	sq.m./ inhabitant	
	Information sources:	Calculated data - Municipal data bank	
	Assessment method:	Calculate the sq.m./inhabitant of sport and recreational areas	
	Territorial Scale:	All	
	Standards or references:	Veneto regional law lr 11/2004	

C3		HEALTH SERVICES	
C.3.1	Coverage ratio of emergency services		
	Intent:	To assess the ease of access for a potential development on the site to emergency police, fire or health services in the neighbourhood	
	Indicator:	Coverage ratio of emergency services	
	Unit of measure:	%	
	Information sources:	Measured data	
	Assessment method:	25 points if there is civil protection 25 points if there are health services 25 points if there are firefighters 25 points if there are police forces full points if they are within the territorial unit, reduced to two-thirds within close proximity, reduced to one third if distant.	
	Territorial Scale:	All	
	Standards or references:	Local government planning department	
C.3.2	Number of doctors in the territory		
	Intent:	To assess the accessibility to healthcare	
	Indicator:	Doctors presence on the territory	
	Unit of measure:	n / inhabitant	
	Information sources:	Calculated data	
	Assessment method:	Calculate the number of doctors for inhabitants	
	Territorial Scale:	Small	
	Standards or references:	Regional health agency depending from the State Department (ARS in France) to get the number of doctors, National statistic institute responsible for the general population census (INSEE in France)	
C.3.3	Housing for elderly people		
	Intent:	To measure the availability of housing for elderly people	
	Indicator:	Places in old people's home	
	Unit of measure:	Number	
	Information sources:	Measured data	
	Assessment method:	$(\sum \text{existing beds} / \text{Inhabitant}) * 1000$ Existing beds in: assisted living homes for seniors, nursing homes for seniors	
	Territorial Scale:	All	
	Standards or references:	Municipality's maps for institutions for assisted living or nursing homes of the municipality	

C.3.4	Medical provision	
	Intent:	To measure the medical care
	Indicator:	Available beds in hospital per inhabitants
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	$(\sum \text{existing beds} / \text{Inhabitant}) * 100$
	Territorial Scale:	All
	Standards or references:	Open Data Lombardia, Welfare General Direction, Data from hospitals of the municipality
C.3.5	Access to health services	
	Intent:	Increase health services for inhabitants
	Indicator:	Share of the population more than 20 minutes away from at least one of the local health services
	Unit of measure:	%
	Information sources:	Statistical data
	Assessment method:	Calculate the share of the population more than 20 minutes away from at least one of the local health services.
	Territorial Scale:	
	Standards or references:	Official statistics data bases

C4		EDUCATION	
C.4.1	Presence of a school transport vehicles		
	Intent:	To ensure the presence of the school transport vehicles in the area	
	Indicator:	Presence of the school transport vehicles	
	Unit of measure:	%	
	Information sources:	Measured data	
	Assessment method:	Calculate the percentage of students transported by a school transport vehicles on the total number of students	
	Territorial Scale:	Small	
	Standards or references:	Urban Plan for Sustainable Mobility	
C.4.2	Educational farms		
	Intent:	Increase environmental friendly culture	
	Indicator:	Educational farms on total farms	
	Unit of measure:	%	
	Information sources:	Calculated data	
	Assessment method:	Calculate the number of educational farms over the total number of farms in the area. Educational farms are farms engaged in educating the public, especially for school groups and young people within their school and extracurricular activities. Regionally accredited companies are included in the Network of Educational Farms	
	Territorial Scale:	All	
	Standards or references:	Regione Lombardia. Agricolture General Direction	

C5		EFFICIENCY OF INFRASTRUCTURES	
C.5.1	District heating density		
	Intent:	To save energy	
	Indicator:	Proportion of connected segments of district heating in the territory	
	Unit of measure:	Number/km	
	Information sources:	Use of statistics on local energy provider's data	
	Assessment method:	Calculate the number of connected households related to km of district heating network	
	Territorial Scale:	All	
	Standards or references:	Technical standard, Database of the national district heating grid	
C.5.2	District heating network		
	Intent:	To save energy	
	Indicator:	Proportion of people that have district heating compared to all of the inhabitants	
	Unit of measure:	%	
	Information sources:	Use of statistics on local energy provider's data	
	Assessment method:	Calculate the proportion of people that have district heating compared to all of the inhabitants	
	Territorial Scale:	All	
	Standards or references:	Technical standard, Database of the national district heating grid	
C.5.3	Efficiency in the distribution of water for human consumption		
	Intent:	To reduce water consumption	
	Indicator:	Water delivered over the total introduced into distribution networks	
	Unit of measure:	%	
	Information sources:	Measured data	
	Assessment method:	Calculate the percentage of delivered water to the total water introduced into municipal distribution networks	
	Territorial Scale:	Small	
	Standards or references:	Data provided by ISTAT, National Institute for Statistics	

C.5.4	Flexible energy capacity	
	Intent:	To shave energy demand peaks
	Indicator:	Ratio of potential capacity over energy demand
	Unit of measure:	%
	Information sources:	Data from energy providers and small generation systems installed in the area
	Assessment method:	The total potential capacity is calculated as the sum of all the energy stored in the non-peak hours and the shifted load (i.e., surplus from surrounding buildings/areas). The potential capacity is divided by the hourly energy consumed in the area during peak load areas, and multiplied by 100 to obtain a percentage value.
	Territorial Scale:	Small
	Standards or references:	From NewTREND Project D2.2

C6		INFORMATION AND COMMUNICATION	
C.6.1	Broadband supply		
	Intent:	To measure the dwelling with access to broadband supply	
	Indicator:	Share of households with a linkage to broadband > 2048 kBit/s	
	Unit of measure:	%	
	Information sources:	Statistic data	
	Assessment method:	Calculate the share of households with a linkage to broadband > 2048 kBit/s / Σ households in the community	
	Territorial Scale:	All	
	Standards or references:	Statistic data of the Bayerisches Breitbandzentrum (Bayerisches Staatsministerium der Finanzen, für Landesentwicklung und Heimat), Broadband connection maps by government or service provider	
C.6.1 bis	Broadband supply		
	Intent:	To measure the dwelling with access to broadband supply	
	Indicator:	Share of households with a linkage to broadband > 30 Mbps	
	Unit of measure:	%	
	Information sources:	"MISE - Strategic Plan Ultra Wide Band	
	Assessment method:	http://bandaultralarga.italia.it/mappa-bul/regione/veneto/5/comune/feltre/25021/ "	
	Territorial Scale:	Calculate the share of households with a broadband connection > 30 Mbps / Σ households in the community	
	Standards or references:	All	
C.6.2	Cell phone connection		
	Intent:	To ensure comprehensive cell phone connection	
	Indicator:	Number of cell phone connections in the area	
	Unit of measure:	Number/km ² ; %	
	Information sources:	Statistic data, measurement, maps by government or service provider,	
	Assessment method:	Option 1: Number of cell phone connections in the area Option 2 Area covered by the service on the total considered area	
	Territorial Scale:	All	
	Standards or references:	Mobile phone network, Global System for Mobile Communications (GSM)	

C.6.3	Ultra-wide band supply	
	Intent:	To measure the dwelling with access to Ultra-wide band supply
	Indicator:	Households with a linkage to Ultra-wide band > 100 Mbps
	Unit of measure:	%
	Information sources:	Measured data
	Assessment method:	Calculate the percentage of households with a linkage to Ultra-wide band > 100 Mbps related to the \sum households in the community
	Territorial Scale:	All
	Standards or references:	Ministry of Economic Development, Infratel Italia (Italy)
C.6.4	Digital divide	
	Intent:	To improve the digital divide, information access and communication in the rural areas of the Alpine Space
	Indicator:	Percentage of internet connections in the territory
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	Calculate (number of internet connections in the territory / territory's total households) * 100
	Territorial Scale:	All
	Standards or references:	https://www.destatis.de/DE/ZahlenFakten/GesellschaftStaat/EinkommenKonsumLebensbedingungen/AusstattungGebrauchsguetern/Tabellen/ZeitvergleichAusstattung_IKT.html http://speedtest.t-online.de Sustainable development of communities - Indicators for city services and quality of life (ISO 37120:2014)

C7		BASIS-INFRASTRUCTURE	
C.7.1	Sewerage connection degree		
	Intent:	To measure the connection degree households to the waste water system	
	Indicator:	Degree of connection to the waste water system	
	Unit of measure:	%	
	Information sources:	Calculated data	
	Assessment method:	Calculate the number of households connected to the system divided by the total number of households of the municipality	
	Territorial Scale:	All	
	Standards or references:	http://www.eea.europa.eu/data-and-maps/indicators/urban-waste-water-treatment/urban-waste-water-treatment-assessment-3 Waste water system manager / waste water system plan and municipality statistics	
C.7.2	Sewerage system size		
	Intent:	To monitor / compare how much sewage pipe (and therefor highly costs) is needed for the waste water of the people	
	Indicator:	Length of sewage pipe needed per household	
	Unit of measure:	m/n	
	Information sources:	Calculated data	
	Assessment method:	Calculate the total system length of sewage pipe divided by number of households	
	Territorial Scale:	All	
	Standards or references:	https://www.publicconsulting.at/fileadmin/user_upload/media/umweltfoerderung/Dokumente_Betriebe/Wasser_Betriebe/Studien_Wasserwirtschaft/Branchenbild_2016.pdf Waste water system manager, waste water system plan and municipality statistics	

C.7.3	Sewerage system condition	
	Intent:	To monitor how much of the waste water system (and therefor highly costs) has to be replaced soon
	Indicator:	Share of system older than 30 years
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	Calculate the length of the waste water system which is older than 30 years divided by the total length of the waste water system
	Territorial Scale:	All
	Standards or references:	https://www.publicconsulting.at/fileadmin/user_upload/media/umweltfoerderung/Dokumente_Betriebe/Wasser_Betriebe/Studien_Wasserwirtschaft/Branchenbild_2016.pdf Waste water system manager, waste water system plan and municipality statistics
C.7.4	Street lighting network size	
	Intent:	To monitor / compare the size (points of light) of the street lighting network
	Indicator:	Points of light
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	Calculate the number of points of light for street lighting divided by the number of inhabitants
	Territorial Scale:	Medium
	Standards or references:	Infrastructure manager, plan of streets and municipality statistics

6.4 D- SOCIETY

D1		DEMOGRAPHY	
D.1.1	Population balance		
	Intent:	To monitor the balance between emigration and immigration	
	Indicator:	Emigration and immigration flows	
	Unit of measure:	Inh.	
	Information sources:	Calculated data	
	Assessment method:	Population balance [inh.] = Positive development of inhabitants - Negative development of inhabitants	
	Territorial Scale:	All	
	Standards or references:	Eurostat (2015): People in the EU – statistics on demographic changes. Available at http://ec.europa.eu/eurostat/statistics-explained/index.php/People_in_the_EU_%E2%80%93_statistics_on_demographic_changes (14.11.2017). Eurostat (2017): Population statistics at regional level. Available at http://ec.europa.eu/eurostat/statistics-explained/index.php/Population_statistics_at_regional_level (14.11.2017)	
D.1.2	Balance of migration (immigration flows) over the last 5 years		
	Intent:	To monitor the compatibility of immigration	
	Indicator:	Number of immigrants	
	Unit of measure:	Number	
	Information sources:	Statistic data	
	Assessment method:	$(\sum \text{immigrants} / \text{Inhabitant}) * 1000$ Calculate that for the last 5 years includes EU immigrants	
	Territorial Scale:	All	
	Standards or references:	Statistical Institutes	
D.1.3	Emigration		
	Intent:	To monitor the degree of emigration	
	Indicator:	Number of emigrants (per 1,000 inhabitants and year)	
	Unit of measure:	n / 1,000 inhabitants in the year YYYY	
	Information sources:	Calculated data	
	Assessment method:	Calculate the number of people in the resident registration database who deregistered their place of residence from a certain municipality in the year YYYY	
	Territorial Scale:	Small	
	Standards or references:	Measured data, Bayerische Verwaltung für Ländliche Entwicklung - Vitalitäts-Check 2.0 zur Innenentwicklung für Dörfer und Gemeinden Leitfaden, Resident registration or Municipality	

D.1.4	Young people neither in employment nor in education or training	
	Intent:	To assess the unemployment situation of young people on the territory including the unemployed and the "inactive" young people
	Indicator:	Percentage of NEET young people (aged 18-24 years) on the whole population in the relevant age class
	Unit of measure:	%
	Information sources:	Statistics data
	Assessment method:	Calculate the percentage of NEET people aged 18-24 years (unemployed young people + inactive young people) on the whole population in the relevant age class
	Territorial Scale:	All
	Standards or references:	Data from the EU Labour Force Survey (EU LFS), EUROSTAT http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=edat_lfse_20&lang=en
D.1.5	Population growth	
	Intent:	Ensuring the peopling through demographic stability
	Indicator:	Population growth
	Unit of measure:	% (percentage increase / decrease)
	Information sources:	Municipal data bank - Veneto Region (for example: http://statistica.regione.veneto.it/jsp/popolazione-demog.jsp?anno=2016&x2=5)
	Assessment method:	Comparison of a twenty-year demographic series: percentage increase / decrease of the current value compared to the most populated year
	Territorial Scale:	All
	Standards or references:	Municipal statistic office
D.1.6	Migration balance	
	Intent:	Evaluate the weight of immigration on demographic trends
	Indicator:	Contribution of migrations in the demographic trend
	Unit of measure:	%
	Information sources:	Calculated data - Municipal statistic office
	Assessment method:	Immigrants + emigrants / immigrants + emigrants + born + dead
	Territorial Scale:	All
	Standards or references:	Municipal statistic office

D2		SOCIO-ECONOMIC ASPECTS	
D.2.1	Accessibility of disabled people to social housing		
	Intent:	To assess that the policies ensures the mixité of population	
	Indicator:	Percentage of social housing accessible to disabled people	
	Unit of measure:	%	
	Information sources:	Measured data	
	Assessment method:	Calculate the percentage of social housing accessible to disabled people	
	Territorial Scale:	All	
	Standards or references:	CCL CESBA ALPS	
D.2.2	Evaluation of the fuel poverty		
	Intent:	To assess the level of fuel poverty on the territory and with it, economic fragility and dependence to energy prices	
	Indicator:	People spending more than the Local Reference Value of income in energy bills, building and transport	
	Unit of measure:	%	
	Information sources:	Local/regional statistics, studies	
	Assessment method:	Calculate the percentage by national standardised method to evaluate the revenue and the energy expenditure	
	Territorial Scale:	Large	
	Standards or references:	CCL CESBA ALPS	
D.2.3	Poverty and social exclusion		
	Intent:	To assess the state of people's well being	
	Indicator:	The at-risk-of-poverty rate is the percentage of persons living in households in which disposable income (including social transfers and pensions) is below the at-risk-of-poverty threshold (60% of median of disposable income of all households)	
	Unit of measure:	%	
	Information sources:	Statistical data.	
	Assessment method:	$\frac{\text{Number of inhabitants below threshold [inh.]}}{\text{Territory's total population [inh.]}} * 100$	
	Territorial Scale:	Large	
	Standards or references:	Eurostat (2017): Mean and median income by household type - EU-SILC survey. Available at http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do (25.08.2017) Data and Methods of EU regulations, EU SILC Methodology Statistical Office of Republic of Slovenia, Eurostat	

D.2.4	Quality of life - Satisfaction	
	Intent:	To assess the opinion of inhabitants about their well being
	Indicator:	Life satisfaction
	Unit of measure:	%
	Information sources:	Statistical data (via surveys)
	Assessment method:	Evaluate life satisfaction measuring the subjective level of general satisfaction of the population (belongs among the most important expressions of the well-being of individuals). Showing share of satisfied people (very satisfied /satisfied)
	Territorial Scale:	Large
	Standards or references:	Regulation (EC) nr. 1177/2003, Eurobarometer, EU SILC Methodology
D.2.5	Rate of reported robberies	
	Intent:	To assess the urban security and crime prevention
	Indicator:	Reported robberies
	Unit of measure:	n / inhabitants
	Information sources:	Measured data
	Assessment method:	Calculate the number of robberies reported over 10.000 inhabitants
	Territorial Scale:	Small
	Standards or references:	Data provided by ISTAT, National Institute for Statistics
D.2.6	Commuter balance	
	Intent:	To monitor the balanced relation of working and living
	Indicator:	Percentage of employed out of the Municipality
	Unit of measure:	%
	Information sources:	Statistic data
	Assessment method:	Calculate the percentage of employed out of the Municipality over the total employed
	Territorial Scale:	All
	Standards or references:	Bayerische Verwaltung für Ländliche Entwicklung - Vitalitäts-Check 2.0 zur Innenentwicklung für Dörfer und Gemeinden Leitfaden

D.2.7	Satisfaction with time distribution	
	Intent:	To find about the inhabitants opinion about their use of time
	Indicator:	Satisfaction with distribution of time
	Unit of measure:	Measured data (Index)
	Information sources:	Statistical gathered data (via surveys)
	Assessment method:	Evaluate the satisfaction of adults with distribution of time between work and other things in life. The average assessment is on the scale from 0 (very dissatisfied) to 10 (very satisfied)
	Territorial Scale:	Large
	Standards or references:	Methodology by European Social Survey (ESS)
D.2.8	Urban/ rural classification	
	Intent:	To show the urban/rural nature of areas
	Indicator:	Share of population living in urban/rural areas
	Unit of measure:	%
	Information sources:	Statistical data
	Assessment method:	Calculate the number of people living in urban/rural areas divided by all inhabitants
	Territorial Scale:	All
	Standards or references:	Statistical Office of Republic of Slovenia
D.2.9	Share of social housing in the territory	
	Intent:	To ease access to social housing
	Indicator:	Share of social housing
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	$(\text{Number of social housing} / \text{total housing stock}) * 100$
	Territorial Scale:	Small
	Standards or references:	State Department for housing (MEDDE/DGALN/DHUP for France as regard to respect to social housing law), National statistic institute (INSEE - FILOCOM in France) for large scale
D.2.10	Part of unacceptable and substandard housing in the territory	
	Intent:	To assess unfit housing
	Indicator:	Share of unfit housing
	Unit of measure:	%
	Information sources:	Statistic data
	Assessment method:	$(\text{number of unfit housing} / \text{total stock}) * 100$
	Territorial Scale:	Small
	Standards or references:	State Department for housing (MEDDE/DGALN/DHUP for France and data from the ORTHI tool or PPPI provided by ANAH)

D.2.11	Social water tariff	
	Intent:	To ease access to a public first necessity good
	Indicator:	Percentage of population covered by a social tariff
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	(population of cities covered by a social tariff/total population)*100
	Territorial Scale:	All
	Standards or references:	State Department for environment, energy and sea, national association for local authorities and public service concession, general census from national institute of statistic (INSEE in France)
D.2.12	Wage differences between women and men	
	Intent:	To maintain gender equality in the labour market
	Indicator:	Median wage of women to that of men
	Unit of measure:	%
	Information sources:	Statistic data
	Assessment method:	Calculate the ratio of the median wage of women to that of men
	Territorial Scale:	All
	Standards or references:	Data provided by Lohnstatistik, Landesverwaltung Liechtenstein, Statistik Liechtenstein - Indikatoren für eine nachhaltige Entwicklung 2016
D.2.13	Recipients of economic social assistance	
	Intent:	To control poverty
	Indicator:	Clients of the total population
	Unit of measure:	%
	Information sources:	Measured data
	Assessment method:	Calculate the percentage of the clients of the total population
	Territorial Scale:	All
	Standards or references:	Data provided by Amt für Soziale Dienste, Rechenschaftsbericht der Regierung, Landesverwaltung Liechtenstein, Statistik Liechtenstein - Indikatoren für eine nachhaltige Entwicklung 2016

D.2.14	Education		
	Intent:	To analyse the rate of population with at least secondary education (important for wellbeing)	
	Indicator:	Population with at least secondary education	
	Unit of measure:	%	
	Information sources:	Statistical data	
	Assessment method:	Calculate the percentage of the population with at least secondary education divided by all inhabitants	
	Territorial Scale:	All	
	Standards or references:	Statistical Office of Republic of Slovenia	
D.2.15	Environmental education		
	Intent:	Percentage of schools with environmental education / graduates served	
	Indicator:	Population with environmental/sustainability education	
	Unit of measure:	%	
	Information sources:	Statistical data	
	Assessment method:	Calculate the percentage of population with at least environmental education divided by total number of inhabitants	
	Territorial Scale:	All	
	Standards or references:	http://www.uis.unesco.org/Education/Documents/43-indicators-to-monitor-education2030.pdf	
D.2.16	Level of school dropout		
	Intent:	To minimize the school dropout in the territory for elementary and low high school	
	Indicator:	School dropouts rates	
	Unit of measure:	%	
	Information sources:	Measured data	
	Assessment method:	Calculate the ratio between school dropout and the total number of students	
	Territorial Scale:	All	
	Standards or references:	Data provided by ISTAT, National Institute for Statistics (Italy)	
D.2.17	Rate of university graduate		
	Intent:	Evaluate the educational level	
	Indicator:	Rate of university graduate	
	Unit of measure:	%	
	Information sources:	Measured data	
	Assessment method:	Calculate the number of university graduate over the total inhabitants	
	Territorial Scale:	Small	
	Standards or references:	Data provided by ISTAT, National Institute for Statistics (Italy)	

D.2.18	Rate of high school graduate	
	Intent:	Evaluate the educational level
	Indicator:	Rate of high school graduate
	Unit of measure:	%
	Information sources:	Measured data
	Assessment method:	Calculate the number of high school graduate over the total inhabitants
	Territorial Scale:	Small
	Standards or references:	Data provided by ISTAT, National Institute for Statistics (Italy)
D.2.19	Occupation by gender	
	Intent:	Pursuit of occupations corresponding to training and competencies
	Indicator:	Employed women compared to the total number of employed persons in the territory
	Unit of measure:	%
	Information sources:	Statistic data
	Assessment method:	$\frac{\text{Number of employed women}}{\text{Total number of employed persons}} * 100$
	Territorial Scale:	All
	Standards or references:	Council of the European Union (2015): Council Conclusions – Equality between women and men in the field of decision-making. Available at http://www.consilium.europa.eu/en/press/press-releases/2015/12/07-epsco-council-conclusions-on-equality-women-men-decision-making/ (25.10.2017)
D.2.19 bis	Occupation by gender	
	Intent:	Promote gender equality
	Indicator:	Employed women compared to the total active female population
	Unit of measure:	%
	Information sources:	ISTAT– National Institute of Statics http://ottomilacensus.istat.it/comune/025/025021/
	Assessment method:	Calculate the number of employed women in the territory (numerator) divided by the active female population (denominator). The result shall then be multiplied by 100 and expressed as a percentage
	Territorial Scale:	All
	Standards or references:	ISTAT– National Institute of Statics

D.2.20	Gross Income	
	Intent:	To increase income for habitants
	Indicator:	Per capita gross income (or Economic Value Added, EVA)
	Unit of measure:	Euro/inhabitant
	Information sources:	Statistic data
	Assessment method:	$\frac{\text{Total gross disposable income [€]}}{\text{Territory's total population [inh.]}}$
	Territorial Scale:	Large
	Standards or references:	<p>Eurostat (2016): Sustainable development in the European Union. A statistical glance from the viewpoint of the UN Sustainable Development Goals. 2016 edition. Available at http://ec.europa.eu/eurostat/documents/3217494/7745644/KS-02-16-996-EN-N.pdf/eae6b7f9-d06c-4c83-b16f-c72b0779ad03 (22.08.2017)</p> <p>Regione Lombardia (2016): Annuario Statistico regionale Lombardia - Regional Statistics Annual Report Lombardia. Available at http://www.asr-lombardia.it/RSY (13.11.2017)</p>
D.2.21	Affordability of residential rental or cost levels	
	Intent:	To assess whether rents or costs of residential units in the Design will be affordable for the target market
	Indicator:	Affordability of residential occupancies relative to average income
	Unit of measure:	%
	Information sources:	Measured data
	Assessment method:	Calculate the total occupancy cost (rental or total charges and upkeep of a purchased unit) as a percentage of modal household income in the area
	Territorial Scale:	All
	Standards or references:	SBTool iisBE International
D.2.22	Property of the population and economic security	
	Intent:	To monitor the economic situation, larger consumption has a positive impact on well-being
	Indicator:	Household financial assets per capita
	Unit of measure:	€ per capita
	Information sources:	Monitored data
	Assessment method:	Calculate the household financial assets per capita that cover all financial assets available to households
	Territorial Scale:	Large
	Standards or references:	Eurostat, Statistical Office of Republic of Slovenia, Bank of Slovenia, Methodology by the European System of National and Regional Accounts (ESA 2010)

D.2.23	Improvement of the building stock of lower income people	
	Intent:	To assess the efforts of the territory to reduce fuel poverty
	Indicator:	Number of dwellings of modest people renovated
	Unit of measure:	Number
	Information sources:	Local monitoring, statistics, subsidies form state, counties and local authorities
	Assessment method:	Calculate the number of housing renovation project with subsidies for lower income people per year using list of policies and subsidies concerning modest people
	Territorial Scale:	Large
	Standards or references:	Cera (Regional Economic observatory in Rhône Alps)
D.2.24	Early leavers from education and training	
	Intent:	To limit social exclusion and poverty risk, to ease the access in the labour market
	Indicator:	Share of early leavers from education and training
	Unit of measure:	%
	Information sources:	Statistic data
	Assessment method:	Percentage of the population aged 18–24 with at most lower secondary education and who were not in further (formal or non-formal) education or training during the last four weeks preceding the survey. Lower secondary education refers to ISCED (International Standard Classification of Education) 2011 level 0–2 for data from 2014 onwards and to ISCED 1997 level 0–3C short for data up to 2013. The indicator is based on the data from the EU Labour Force Survey (EU LFS).
	Territorial Scale:	All
	Standards or references:	UN global list of SDG indicators, EUROSTAT (online data code: edat_lfse_02)
D.2.25	Poverty and social exclusion	
	Intent:	To assess the state of people's well being
	Indicator:	The at-risk-of-poverty rate
	Unit of measure:	%
	Information sources:	Statistical data.
	Assessment method:	Percentage of persons living in households in which disposable income (including social transfers and pensions) is below the at-risk-of-poverty threshold (60% of median of disposable income of all households). Data and Methods of EU regulations, EU SILC Methodology
	Territorial Scale:	Large
	Standards or references:	Statistical Office of Republic of Slovenia, EUROSTAT http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=t2020_50&plugin=1

D.2.26		Employment rate of young people (15-24 years old)	
	Intent:	Assess the youth employment situation	
	Indicator:	People employed aged 15-24 years	
	Unit of measure:	%	
	Information sources:	Measured data	
	Assessment method:	Calculate the percentage of people employed aged 15-24 years on the whole population in the relevant age class	
	Territorial Scale:	All	
	Standards or references:	Data provided by ISTAT, National Institute for Statistics (Italy)	
D.2.27		Unemployment rate	
	Intent:	To reduce unemployment	
	Indicator:	Employed people (15-64 years old) rate on the whole population in the relevant age class	
	Unit of measure:	%	
	Information sources:	Calculated data	
	Assessment method:	Calculate the Territory's employment rate as the number of employed inhabitants [inh.] over the total labor force [inh.]	
	Territorial Scale:	Large	
	Standards or references:	Data provided by ISTAT, National Institute for Statistics, Census or interviews to families, EUROSTAT http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=t2020_10&plugin=1	
D.2.28		Employment rate (15-64 years old)	
	Intent:	To increase the employment rate among the working-age population and monitor the economic growth of the territory	
	Indicator:	Territory's unemployment rate	
	Unit of measure:	%	
	Information sources:	Statistic data	
	Assessment method:	$\frac{\text{Number of Unemployed Inhabitants [inh.]}}{\text{Total labor force [inh.]}} * 100$	
	Territorial Scale:	All	
	Standards or references:	ISO 37120:2014-05: Sustainable development of communities – Indicators for city services and quality of life (2014-05)	

D.2.28 bis	Employment rate (15-64 years old)	
	Intent:	To reduce unemployment
	Indicator:	Employed people (15-64 years old) rate on the whole population in the relevant age class
	Unit of measure:	%
	Information sources:	ISTAT, http://ottomilacensus.istat.it/comune/025/025021/
	Assessment method:	https://statistica.provincia.belluno.it/index.php/home-stat
	Territorial Scale:	Calculate the Territory's employment rate as the number of unemployed inhabitants [inh.] over the total labour force [inh.]
	Standards or references:	All
D.2.29	Design for All	
	Intent:	To increase the number of public accessible space, including buildings, parks and squares
	Indicator:	Share of accessible buildings and squares
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	$\frac{\text{Number of public buildings ISO 21542}}{\text{Total number of public buildings}}$
	Territorial Scale:	All
	Standards or references:	ISO 21542:2011-12: Building construction - Accessibility and usability of the built environment (2011-12)
D.2.30	Accessibility of protected cultural goods	
	Intent:	To improve inclusive growth
	Indicator:	Percentage of cultural goods accessible to people with disabilities
	Unit of measure:	%
	Information sources:	Data banks , Municipality
	Assessment method:	Calculate the number of protected goods (immovable properties) on the territory, taking in account all the types of instruments of cultural goods protection which at various institutional levels addressed to the goods: singular protected goods for artistic, architectural, monumental, historical and traditional interest, and for archaeological relevance. Calculate the percentage (%) of protected goods accessible to people with disabilities on the total amount
	Territorial Scale:	All
	Standards or references:	Managing associations or bodies EU, European Tourism Indicators System for sustainable destination management http://ec.europa.eu/growth/sectors/tourism/offer/sustainable/indicators_it

D.2.31	Accessibility of protected landscape heritage	
	Intent:	To improve inclusive growth
	Indicator:	Percentage of protected landscape goods accessible to people with disabilities
	Unit of measure:	%
	Information sources:	Data banks , Municipality
	Assessment method:	<p>Calculate the total number of protected landscape on the territory, taking in account all the types of instruments of landscape goods protection which at various institutional levels addressed to landscape:</p> <p>landscape areas protected for their historical, archaeological, traditional, rural, naturalistic and aesthetic/visual importance, including historical centres and settlements, archaeological areas, Unesco Sites and Unesco Biosphere Reserves.</p> <p>Calculate the percentage (%) of protected landscape areas accessible to people with disabilities on the total amount</p>
	Territorial Scale:	All
	Standards or references:	<p>"Managing associations or bodies EU, European Tourism Indicators System for sustainable destination management http://ec.europa.eu/growth/sectors/tourism/offer/sustainable/indicators_it"</p>

D.2.32	Accessibility of protected natural heritage	
	Intent:	To improve inclusive growth
	Indicator:	Percentage of natural goods accessible to people with disabilities
	Unit of measure:	%
	Information sources:	Data banks , Municipality
	Assessment method:	<p>Calculate the total number of protected natural areas on the territory taking in account all the types of instruments of natural goods protection which at various institutional levels addressed to natural areas:</p> <ul style="list-style-type: none"> • National Parks • Regional and interregional natural parks • Natural reserves • Special protection zones • Special storage areas • Wetlands of international interest • Other protected natural areas • Terrestrial and Marine Reconnaissance Areas <p>Calculate the percentage (%) of protected natural areas accessible to people with disabilities on the total amount</p>
	Territorial Scale:	All
	Standards or references:	<p>"Managing associations or bodies EU, European Tourism Indicators System for sustainable destination management http://ec.europa.eu/growth/sectors/tourism/offer/sustainable/indicators_it"</p>
D.2.33	Share of secondary residences	
	Intent:	To show the population fluctuations according to touristic seasons
	Indicator:	Rate of secondary residences
	Unit of measure:	%
	Information sources:	Statistic data
	Assessment method:	Calculate the ratio between the number of secondary residences and the total number of residences
	Territorial Scale:	All
	Standards or references:	INSEE, France

D3		CULTURAL ASPECTS	
D.3.1	Degree of promotion of the cultural offer of the State Institutes		
	Intent:	Dissemination of cultural activities	
	Indicator:	Visitors of the State Institutes of Antiquities and Art	
	Unit of measure:	n	
	Information sources:	Measured data	
	Assessment method:	Calculate the number of paying visitors of the State Institutes of Antiquities and Art as compared to those non-paying	
	Territorial Scale:	Small	
	Standards or references:	Data provided by ISTAT, National Institute for Statistics	
D.3.2	Degree of diffusion of theatre and musical shows		
	Intent:	Dissemination of theatre and musical activities	
	Indicator:	Diffusion of theatre and musical activities	
	Unit of measure:	n / 100 inhabitants	
	Information sources:	Measured data	
	Assessment method:	Calculate the number of tickets sold for theatre and musical activities every 100 inhabitants	
	Territorial Scale:	Small	
	Standards or references:	Data provided by ISTAT, National Institute for Statistics	
D.3.3	Cultural institutions		
	Intent:	To compare the development of the territories in culture sector	
	Indicator:	Cultural capital	
	Unit of measure:	Nr. of cultural institutions per inhabitants	
	Information sources:	Statistical data	
	Assessment method:	Calculate the number of cultural institutions divided by all inhabitants and multiplied by 10.000	
	Territorial Scale:	All	
	Standards or references:	Statistical Office of Republic of Slovenia	
D.3.4	Public libraries		
	Intent:	Increase services for inhabitants	
	Indicator:	Number of public libraries on inhabitants	
	Unit of measure:	Number/inhabitants	
	Information sources:	Measured data	
	Assessment method:	Calculate the number of public libraries in the territory related to the inhabitants	
	Territorial Scale:	All	
	Standards or references:	Open Data Lombardia, Lombardy Region Culture Direction	

D.3.5	Cultural heritage enhancement	
	Intent:	To promote local cultural heritage
	Indicator:	Patrimony open to public
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	Calculate the number of sites opened to public over the total number of sites of interest
	Territorial Scale:	Small
	Standards or references:	Regional inventory for cultural patrimony, Local authorities and touristic offices, general inventory for cultural patrimony produced by the regional Council

D4		LAND USE	
D.4.1	Plan of land use		
	Intent:	To raise awareness for the need of gentle use of land	
	Indicator:	Housing and traffic area compared (resp. In relation) to area used for eco-friendly food production and recreation	
	Unit of measure:	%	
	Information sources:	Calculated data	
	Assessment method:	Calculate the housing and traffic area in relation to the sum of agriculture, recreation, housing and traffic area. Evaluate the development / change compared to the previous year	
	Territorial Scale:	Small	
	Standards or references:	Geographic information system (GIS) database, Municipal Plan of land use	
D.4.2	Green urban areas		
	Intent:	To reduce diminishing of the urban green areas	
	Indicator:	Urban green areas	
	Unit of measure:	%	
	Information sources:	Measured data	
	Assessment method:	Measured the percentage of surface of urban green areas divided by total urban area	
	Territorial Scale:	Small	
	Standards or references:	EU project GREENKEYS, Slovenian legislation about the content of land use plans, Land use Plans made by municipality	
D.4.3	Public civic and leisure spaces		
	Intent:	To measure the area of public spaces available in the territory	
	Indicator:	Amount of urban public spaces (squares, gardens, parks etc.) in the territory	
	Unit of measure:	%	
	Information sources:	Calculated data	
	Assessment method:	Calculate the amount of public space, including built public spaces such as squares etc., and leisure spaces such as urban parks and gardens, over the total territory area	
	Territorial Scale:	All	
	Standards or references:	Liechtenstein Environmental Indicators, Office of Statistics, National Government of Liechtenstein	

D5		ANTROPOGENETIC RISKS	
D.5.1	Forest fire risk		
	Intent:	Reducing risks	
	Indicator:	Forest surface in different levels of fire risk	
	Unit of measure:	%	
	Information sources:	Models and simulation	
	Assessment method:	Calculate the ratio between the forest area in different levels of fire risk related to the total municipal area. The risk of forest fires takes into consideration the probability of the occurrence of fire and also the vulnerability of the territory	
	Territorial Scale:	All	
	Standards or references:	Regione Lombardia. Civil Protection Direction, PRIM - integrated risk mitigation regional programme	
D.5.1 bis	Forest fire risk		
	Intent:	Reducing risks	
	Indicator:	Forest surface affected by fires	
	Unit of measure:	%	
	Information sources:	Provincial Emergency Plan for Forest Fire Risk, or Municipal and Regional data bank (for example: http://webgis.provincia.belluno.it/index.php/view/map/?repository=mappe&project=geoistat)	
	Assessment method:	Percentage of forest area affected by fires on total forest area	
	Territorial Scale:	All	
	Standards or references:	Provincial Emergency Plan for Forest Fire Risk (Piano di Emergenza provinciale Rischio Incendi Boschivi)	
D.5.2	Location of territory relative to zones of fire risk		
	Intent:	To assess the risk of the project site being subject to forest or bush fires	
	Indicator:	Presence of areas of high fire risk	
	Unit of measure:	m	
	Information sources:	Measured data	
	Assessment method:	Calculate the distance from areas of high fire risk	
	Territorial Scale:	Large	
	Standards or references:	Site analysis report, local government planning department, environmental agencies, non government organization, SBTool iiSBE International	

D.5.3	Risk to occupants and facilities from earthquake	
	Intent:	To assess the risk to live and property of potential earthquake events
	Indicator:	Risk from earthquake
	Unit of measure:	Index
	Information sources:	Estimate of the probability
	Assessment method:	Evaluate the predicted ability of structures to withstand the effects of foreseeable earthquake events and the probability of injury or death or property damage in case of earthquake event foreseeable within a 100-year time frame
	Territorial Scale:	Large
	Standards or references:	Technical documents about emergency measures, local planning and/or emergency measures organisations, SBTool iisBE International
D.5.4	Population exposed to landslide risk	
	Intent:	To limit the risk of landslides in populated areas
	Indicator:	Exposure to landslide risk
	Unit of measure:	inhabitants/km2
	Information sources:	Measured data
	Assessment method:	Evaluate the number of inhabitants per km2 exposed to landslide risk, for classes
	Territorial Scale:	All
	Standards or references:	Data provided by ISTAT, National Institute for Statistics
D.5.5	Population exposed to flood risk	
	Intent:	Limit the risk of floods in populated areas
	Indicator:	Exposure to flood risk
	Unit of measure:	inhabitants/km2
	Information sources:	Measured data
	Assessment method:	Evaluate the number of inhabitants per km2 exposed to floods risk, for classes
	Territorial Scale:	All
	Standards or references:	Data provided by ISTAT, National Institute for Statistics
D.5.6	Population exposed to industrial risk	
	Intent:	Limit the risk of industrial in populated areas
	Indicator:	Inhabitants per km2 exposed to industrial risk for classes
	Unit of measure:	inhabitants/km2
	Information sources:	Models and simulation data provided by Regional and National Institution
	Assessment method:	Calculate the number of inhabitants exposed to industrial risk in the analysed area
	Territorial Scale:	All
	Standards or references:	http://www.regione.piemonte.it/ambiente/siar/sist_informatico.htm

D.5.7	Territory exposed to environmental risks (fire, earthquake, landslide, flood, industrial risk etc)	
	Intent:	Limit the environmental risks due to fire, earthquake, landslide, flood, industrial risk in populated areas
	Indicator:	Inhabitants exposed to environmental risks
	Unit of measure:	inhabitants/km ²
	Information sources:	Statistic data
	Assessment method:	Evaluate the number of inhabitants per km ² exposed to environmental risks
	Territorial Scale:	All
	Standards or references:	Data provided by ISTAT, National Institute for Statistics (Italian)
D.5.8	Population exposed to natural risks	
	Intent:	Limit the natural risks in populated areas
	Indicator:	Inhabitants exposed to natural risks
	Unit of measure:	inhabitants/km ²
	Information sources:	Measured data
	Assessment method:	Calculate the number of inhabitants per km ² exposed to natural risks (fire, landslide, flood)
	Territorial Scale:	All
	Standards or references:	Data provided by ISTAT, National Institute for Statistics
D.5.8 bis	Population exposed to natural risks	
	Intent:	To reduce the population exposed to natural risks
	Indicator:	Inhabitants exposed to natural risks
	Unit of measure:	%
	Information sources:	Municipal Plan of Civil Protection; www.geoviewer.isprambiente.it
	Assessment method:	Percentage given by the ratio between the number of inhabitants exposed to landslides (P3, P4) + number of inhabitants exposed to floods (P3, P4) out of the total population
	Territorial Scale:	All
	Standards or references:	Deliberations of the Regional Council DGR n. 573 del 10/03/2003, DGR 3315 del 21/12/2010
D.5.9	Exposure to natural hazards	
	Intent:	Prevent the natural risks in the territory
	Indicator:	Number of natural disasters reported by municipalities of the territory
	Unit of measure:	number
	Information sources:	Measured data
	Assessment method:	Calculate the annual number of natural disasters reported by municipalities of the territory
	Territorial Scale:	
	Standards or references:	Official data bases

6.5 E-ECONOMY

E1		LOCAL ECONOMY	
E.1.1	Use of eco/local materials		
	Intent:	To assess the use of local material and their value chain	
	Indicator:	Value of eco/local products produced or sold on the territory	
	Unit of measure:	Euros/year ; % GDP	
	Information sources:	Studies, survey, data from producers, sellers	
	Assessment method:	Option 1: Collect data (production and value) from local producers (minimum the more significant of them) related to the corresponding year Option 2: Calculate the Gross Domestic Product	
	Territorial Scale:	Large	
	Standards or references:	Cera (Regional Economic observatory in Rhône Alps)	
E.1.2	Companies with social/environmental certification		
	Intent:	To stimulate sustainability in businesses	
	Indicator:	Level of coverage of certified activities	
	Unit of measure:	%	
	Information sources:	Calculated data by National accreditation agency and accreditation offices	
	Assessment method:	Number of companies with environmental/social certification on total number of enterprises	
	Territorial Scale:	All	
	Standards or references:	Accredia for Italy, Unioncamere (Chambers of Commerce Union), ISO 9001, ISO 14001, EMAS, OHSAS 18001	
E.1.3	Renovation and redevelopment of settlement for production activities abandoned		
	Intent:	To promote actions, projects and retraining programs in settlements for productive activities decommissioned	
	Indicator:	Promotion of production activities decommissioned	
	Unit of measure:	%	
	Information sources:	Measured data	
	Assessment method:	$(S1 / S2) * 100$ S1 = surface of the settlements for productive activities decommissioned subject of redevelopment S2 = total area of the settlements for productive activities decommissioned	
	Territorial Scale:	All	
	Standards or references:	Data provided by ISTAT, National Institute for Statistics	

E.1.4	Cover organic meals served in the canteen	
	Intent:	To develop organic agriculture and local food system
	Indicator:	Cover ratio of local and organic meals served in canteen
	Unit of measure:	%
	Information sources:	Statistic data, public market data for local authorities, accountancy data
	Assessment method:	(number of local and organic meals served / total number meals)*100
	Territorial Scale:	All
	Standards or references:	Department for agriculture, food industry and forest
E.1.5	Budget of RES enterprises	
	Intent:	To assess the budget impact of RES sector on local economy
	Indicator:	Budget of RES sector enterprises
	Unit of measure:	Euros/year
	Information sources:	Economic statistics, survey
	Assessment method:	List of society concerned. Collection of their annual budget.
	Territorial Scale:	Large
	Standards or references:	Cera (Regional Economic observatory in Rhône Alps), ECO Obs
E.1.6	Employment in Energy improvement of the building stock	
	Intent:	To assess the employment impact of local building sector activity
	Indicator:	Number of employees of building sector companies
	Unit of measure:	Number; %
	Information sources:	Economic statistics, survey
	Assessment method:	Option 1: List of companies of the building sector on the territory, collection of their number of employees Option 2: Calculate the number of employees of building sector companies over the total number of employed
	Territorial Scale:	Large
	Standards or references:	Cera (Regional Economic observatory in Rhône Alps) , ECO obs, SEAP Alps

E.1.7	Employment in RES enterprises	
	Intent:	To assess the employment impact of RES sector activity
	Indicator:	Number of employees of RES sector enterprises
	Unit of measure:	Number; %
	Information sources:	Economic statistics, survey
	Assessment method:	Option 1: List of society of the RES production sector on the territory, collection of their number of employees Option 2: Calculate the number of the RES production sector over the total number of employed
	Territorial Scale:	Large
	Standards or references:	Cera (Regional Economic observatory in Rhône Alps) , Eco obs
E.1.8	Development of local label	
	Intent:	To promote local companies and social links
	Indicator:	Local labels
	Unit of measure:	Qualitative data
	Information sources:	Chamber of Commerce (CCI), Known labels groups (ex for France : Bistrot de Pays, Maison de Pays)
	Assessment method:	Listing the labels (name of labels)
	Territorial Scale:	All
	Standards or references:	Regional council
E.1.9	Local currencies for local economic systems	
	Intent:	To support local companies and social links
	Indicator:	Number of euro-equivalent circulating local currency
	Unit of measure:	Euro-equivalent
	Information sources:	Calculated data
	Assessment method:	(amount of local currency) * (exchange rate to euro)
	Territorial Scale:	Small
	Standards or references:	Agenda21, Association in charge of local currency development
E.1.10	Local added value	
	Intent:	To monitor the regional / local added value
	Indicator:	Local added value per inhabitant
	Unit of measure:	€ / inhabitant
	Information sources:	Calculated data
	Assessment method:	Calculate local added value per inhabitant using local economics report
	Territorial Scale:	Medium and Large
	Standards or references:	http://www.regionale-wertschoepfung.info/index.php?tpl=page&id=42&lng=de Local economics report

E.1.11	Labour migration	
	Intent:	To monitor rate of labour force migration of active inhabitants
	Indicator:	Labour migration index
	Unit of measure:	%
	Information sources:	Monitored data
	Assessment method:	To monitor index of labour force migration of active inhabitants by municipality of work place in comparison to all labour active (without farmers) by municipality of residence in percentage
	Territorial Scale:	All
	Standards or references:	Statistical offices, SURS Slovenian, Statistical Register of Employment
E.1.12	Train business to sustainable development	
	Intent:	To develop skills of energy efficiency and renewables systems' installers on the territory
	Indicator:	Labelised installers ("RGE" for France)
	Unit of measure:	Number
	Information sources:	Calculated data
	Assessment method:	Number of labelised installers
	Territorial Scale:	Large
	Standards or references:	Department for environment, energy and sea and their regional services, official registration data from the Department for environment, energy and sea and their regional services
E.1.13	Green Public Procurement	
	Intent:	To increase sustainability of goods and services in the public administration
	Indicator:	Percentage of GPP value in relationship with the total public expenditure for goods, services and works per year
	Unit of measure:	%
	Information sources:	Monitored data provided by Regional Institution
	Assessment method:	Verification of the achievement of GPP target value as share of total public expenditure
	Territorial Scale:	All
	Standards or references:	EU GPP Legal and policy Framework: http://ec.europa.eu/environment/gpp/index_en.htm Italian GPP Legal and policy Framework: DM 24/12/2015 (Minimum Environmental Criteria) and National Action Plan: http://www.minambiente.it/pagina/gpp-acquisti-verdi

E.1.14	Local forest wood supply chain	
	Intent:	To increase the forest wood use at local level
	Indicator:	Calculate the ratio between the forest wood volume produced at local level and the road length to carry the wood to final use
	Unit of measure:	m ³ /km
	Information sources:	Measured data
	Assessment method:	Calculate the forest wood volume produced at local level and the road length to carry the wood to final use
	Territorial Scale:	Small
	Standards or references:	Forestry consortium
E.1.15	Promotion of the building sector	
	Intent:	To assess the economic impact of building sector on local economy
	Indicator:	Turnover of local building sector companies
	Unit of measure:	Euros/year
	Information sources:	Economic statistics, survey
	Assessment method:	Calculation of the sum of the incomes of building sector companies on the territory related to the year
	Territorial Scale:	Large
	Standards or references:	Cera (Regional Economic observatory in Rhône Alps) , Eco Obs
E.1.16	Voluntary Carbon Market by forest management	
	Intent:	To increase local green economy
	Indicator:	Voluntary Carbon Market by forest management
	Unit of measure:	Number/area
	Information sources:	Monitored data
	Assessment method:	Verification of the number of credits. Verification of the extension area
	Territorial Scale:	All
	Standards or references:	EU Project CARBOMARK (LIFE 07 ENV/IT000388) http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=3269 VCS - Verified Carbon Standard (www.v-c-s.org) Standard BNEUTRAL (www.bneutral.eu)

E.1.17	Assessed sustainable standard	
	Intent:	To encourage the design, construction, and retrofit of buildings that utilize green building practices
	Indicator:	Share of assessed buildings
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	$\frac{\text{Number of assessed buildings}}{\text{Total number of buildings}} * 100$
	Territorial Scale:	All
	Standards or references:	<p>Building Research Establishment (BRE) (2017): BREEAM. Available at http://www.breeam.com/ (04.12.2017)</p> <p>Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMUB) (2013): Bewertungssystem Nachhaltiges Bauen (BNB). Available at https://www.bnb-nachhaltigesbauen.de/ (04.12.2017)</p> <p>Céquami (2017): HQE Céquami. Available at http://cequami.fr/ (04.12.2017)</p> <p>Deutsche Gesellschaft für Nachhaltiges Bauen (DGNB) (2017): DGNB System. Available at http://www.dgnb-system.de/de/ (04.12.2017)</p> <p>Instituto per l'innovazione e trasparenza degli appalti e la compatibilità ambientale (ITACA) (2017): Area 2 – Sostenibilità energetica e ambientale. Available at http://www.itaca.org/valutazione_sostenibilita.asp (04.12.2017)</p> <p>U.S: Green building council (USGBC) (2013): LEED 2009 for Neighborhood Development Rating System. Updated October 2013. GIB Credit 1: Certified Green Buildings</p>
E.1.18	Rate of households with potential economic hardship	
	Intent:	To assess the state of people's well-being, Contrast to poverty and social hardship
	Indicator:	Rate of households with potential economic hardship, Households with potential economic hardship
	Unit of measure:	%
	Information sources:	ISTAT http://ottomilacensus.istat.it/comune/025/025021/ - ISTAT https://www.urbanindex.it/indicatori/incidenza-delle-famiglie-con-potenziale-disagioeconomico/
	Assessment method:	Percentage ratio between the number of families with children with the reference person aged up to 64 in which no employee is occupied or withdrawn from work and the total household
	Territorial Scale:	All
	Standards or references:	ISTAT– National Institute of Statics

E.1.19	Business creation dynamics	
	Intent:	Evaluate economic momentum
	Indicator:	Number of business creations
	Unit of measure:	number
	Information sources:	Measured data
	Assessment method:	Calculate the number of business created in a year
	Territorial Scale:	All
	Standards or references:	Official data base

E2		ACTIONS FOR INNOVATION	
E.2.1	Gross enrolment in the Company Register		
	Intent:	Promote productivity and development	
	Indicator:	New companies registered	
	Unit of measure:	n	
	Information sources:	Measured data	
	Assessment method:	Calculate the number of new companies registered at 31/12 of the year	
	Territorial Scale:	All	
	Standards or references:	Data provided by ISTAT, National Institute for Statistics	
E.2.2	Training of handcrafts, SMEs incubators		
	Intent:	To assess the development of local skills in the sustainable construction	
	Indicator:	Qualified people	
	Unit of measure:	%	
	Information sources:	Qualification monitoring data	
	Assessment method:	Calculate the percentage of qualified people, verify significance of the data	
	Territorial Scale:	Large	
	Standards or references:	Cera (Regional Economic observatory in Rhône Alps) , Eco Obs	
E.2.3	Research and Development		
	Intent:	To measure knowledge based economy and its development	
	Indicator:	Index of employment in Research & Development	
	Unit of measure:	%	
	Information sources:	Statistical data	
	Assessment method:	Share of employees in R&D compared to all labour force	
	Territorial Scale:	Large	
	Standards or references:	Eurostat, Statistical Office of Republic of Slovenia, Statistical Offices	
E.2.4	Financial fund for energy saving in SMEs		
	Intent:	To promote energy savings in SMEs	
	Indicator:	Implementation of an energy saving fund	
	Unit of measure:	Euros/GDP	
	Information sources:	Calculated data	
	Assessment method:	Calculate the total amount of money put in the fund over the gross domestic product	
	Territorial Scale:	Small	
	Standards or references:	Local Climate and Energy Plan (PCET), national institute for statistics (INSEE)	

E.2.5	Involvement of citizens and SMEs to the local life, through local networks, partnerships, etc.	
	Intent:	To assess the financial engagement/participation of citizens and enterprises in local funds/society
	Indicator:	Capital raised by local collective investment funds
	Unit of measure:	Euros
	Information sources:	Studies, survey, data from local funds and citizen organisations
	Assessment method:	Calculate the capital raised by local collective investment funds (crowd funding, citizen organisations...) using list of local funds/organisation
	Territorial Scale:	Large
	Standards or references:	HQE ² R

E3 TOURISM															
E.3.1	Tourism rate														
	<table border="1"> <tr> <td>Intent:</td> <td>To increase touristic presences</td> </tr> <tr> <td>Indicator:</td> <td>Touristic rate</td> </tr> <tr> <td>Unit of measure:</td> <td>Days/inhabitant; number/100,000 inhabitants; total tourist nights / (inhabitants x 365 days); attendance (number of nights spent by tourists) / kmq surface of the territory</td> </tr> <tr> <td>Information sources:</td> <td>Statistic data</td> </tr> <tr> <td>Assessment method:</td> <td>Option 1: Days spent (by italians and strangers) in the whole accommodation system, per inhabitant Option 2: Calculate the number of tourists over 100,000 inhabitants Option 3: Calculate total tourist nights related to inhabitants per 365 days Option 4: Evaluate the attendance (number of nights spent by tourists) related to the kmq surface of the territory</td> </tr> <tr> <td>Territorial Scale:</td> <td>Large (province)</td> </tr> <tr> <td>Standards or references:</td> <td>ISTAT, National Institute for Statistics</td> </tr> </table>	Intent:	To increase touristic presences	Indicator:	Touristic rate	Unit of measure:	Days/inhabitant; number/100,000 inhabitants; total tourist nights / (inhabitants x 365 days); attendance (number of nights spent by tourists) / kmq surface of the territory	Information sources:	Statistic data	Assessment method:	Option 1: Days spent (by italians and strangers) in the whole accommodation system, per inhabitant Option 2: Calculate the number of tourists over 100,000 inhabitants Option 3: Calculate total tourist nights related to inhabitants per 365 days Option 4: Evaluate the attendance (number of nights spent by tourists) related to the kmq surface of the territory	Territorial Scale:	Large (province)	Standards or references:	ISTAT, National Institute for Statistics
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Standards or references:	ISTAT, National Institute for Statistics														
E.3.2	Tourist accommodation capacity														
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Unit of measure:	Beds per 1,000 inhabitants														
Information sources:	Measured data														
Assessment method:	Evaluate tourist accommodation capacity as the number of beds per 1.000 inhabitants														
Territorial Scale:	All														
Standards or references:	ISTAT, National Institute for Statistics														
E.3.3	Floating population														
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E.3.4		Tourist attractions	
	Intent:	To measure the free time facilities for tourists	
	Indicator:	Number of tourist attractions	
	Unit of measure:	Number/km ²	
	Information sources:	Measured data	
	Assessment method:	Calculate the number of tourist attractions per km ² (a tourist attraction is a place of interest)	
	Territorial Scale:	All	
	Standards or references:	Municipal tourism portals	
E.3.5		Bed occupancy rate	
	Intent:	To measure the vacantness of beds	
	Indicator:	Bed occupancy rate	
	Unit of measure:	%	
	Information sources:	Measured data	
	Assessment method:	Bed occupancy rate = [booking days / (amount of beds * almanac days)] * 100	
	Territorial Scale:	All	
	Standards or references:	Municipal tourism portals, Statistical Institutes	
E.3.6		Summer tourism	
	Intent:	To develop summer tourism attractiveness to compensate decrease of winter attractiveness	
	Indicator:	Summer tourism revenue share	
	Unit of measure:	%	
	Information sources:	Calculated data	
	Assessment method:	(summer tourism revenue) / (winter tourism revenue)	
	Territorial Scale:	All	
	Standards or references:	touristic syndicates, chamber of ski professional	
E.3.7		Touristic cycling pathways	
	Intent:	To develop summer tourism attractiveness to compensate decrease of winter attractiveness	
	Indicator:	Touristic cycling pathways of bike routes in the land area	
	Unit of measure:	km / km ²	
	Information sources:	Calculated data	
	Assessment method:	Calculate the sum of continuous kilometres of touristic cycling routes over the km ² of land area	
	Territorial Scale:	All	
	Standards or references:	Study on mobility (ORT, regional observatory on transports), State department responsible for roads and local authorities, touristic syndicates, local authorities	

E.3.8	Seasonal staff accommodation		
	Intent:	To tackle housing access for seasonal staff	
	Indicator:	Pressure of seasonal staff on housing	
	Unit of measure:	%	
	Information sources:	Calculated data	
	Assessment method:	Calculate the seasonal staff population over the total population	
	Territorial Scale:	Small	
	Standards or references:	National statistic studies from general census (INSEE for France) and dedicated studies on seasonal	
E.3.9	Ski lifts		
	Intent:	Increase tourism	
	Indicator:	Capacity of ski lifts	
	Unit of measure:	Number of passengers/hour	
	Information sources:	Calculated data	
	Assessment method:	Calculate the number of passengers that can be carried by ski lift per hour	
	Territorial Scale:	All	
	Standards or references:	Open Data Lombardia, Regione Lombardia. Sport and Youngs Direction, Ski resort operators	
E.3.10	Agritourism farmhouses		
	Intent:	Increase tourism	
	Indicator:	Number of agritourism farmhouses	
	Unit of measure:	Number	
	Information sources:	Measured data	
	Assessment method:	Calculate the presence of agritourism farmhouses in the territory	
	Territorial Scale:	All	
	Standards or references:	Open Data Lombardia, Regione Lombardia. Agriculture Direction	
E.3.11	Mountain huts		
	Intent:	Increase tourism	
	Indicator:	Number of mountain huts	
	Unit of measure:	Number	
	Information sources:	Measured data	
	Assessment method:	Calculate the presence of mountain huts in the territory	
	Territorial Scale:	All	
	Standards or references:	Open Data Lombardia, Regione Lombardia. Sport and Youngs Direction	

E.3.12	Touristic flux		
	Intent:	To develop a sustainable tourism	
	Indicator:	Number of arrivals in the area; number of nights spent by tourists in accommodation establishments (potential touristic environmental pressures)	
	Unit of measure:	Arrivals / year; number of nights spent/year	
	Information sources:	Monitored data provided by Regional Institution	
	Assessment method:	Option 1: number of arrival in a year; Option 2: number of nights spent in a year	
	Territorial Scale:	All	
	Standards or references:	State of Environment Report and Environmental Indicators - ARPA Piemonte : http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/uso-delle-risorse/turismo_movimenti-touristici	
E.3.13	Average stay of tourists		
	Intent:	To develop a sustainable tourism	
	Indicator:	The indicator estimates the average stay of tourists in a territory	
	Unit of measure:	Number of nights / number of tourists	
	Information sources:	Monitored data provided by Regional Institution	
	Assessment method:	Ratio between the number of tourists and the number of nights spent in the territory	
	Territorial Scale:	All	
	Standards or references:	State of Environment Report and Environmental Indicators - ARPA Piemonte : http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/uso-delle-risorse/turismo_durata-media-permanenza-touristica	
E.3.14	Touristic pressure		
	Intent:	To develop a sustainable tourism	
	Indicator:	The indicator estimate the touristic pressure in a territory	
	Unit of measure:	Number of arrivals / inhabitants; Number of Tourists / inhabitants; Number of Tourists / Km2	
	Information sources:	Monitored data provided by Regional Institution	
	Assessment method:	Option 1: Ratio between the number of arrivals and the inhabitants; Option 2: Ratio between the number of tourists and the inhabitants; Option 3: Ratio between the number of tourists and territorial area;	
	Territorial Scale:	All	
	Standards or references:	State of Environment Report and Environmental Indicators - ARPA Piemonte : http://www.arpa.piemonte.gov.it/reporting/core-set-of-indicators/tourism/tourism-intensity	

E.3.14 bis		Touristic pressure	
	Intent:	To develop a sustainable tourism	
	Indicator:	The indicator estimate the touristic pressure in a territory and on related services	
	Unit of measure:	Sq.m/ab	
	Information sources:	Municipal and Regional data base	
	Assessment method:	The indicator estimate the touristic pressure in a territory on related services (Floating population (arrives/365) + inhabitants / by the value of C2.4 Public Services space for settlement area)	
	Territorial Scale:	All	
	Standards or references:	Regione Veneto, Direzione Turismo	
E.3.15			
E.3.15		Presence of paths used for tourism	
	Intent:	Promote pedestrian tourism activity	
	Indicator:	Extension of trails/paths used for tourism	
	Unit of measure:	km / km2	
	Information sources:	Measured data	
	Assessment method:	Calculate the length (Km) of trails/paths used for tourism in the area (km2)	
	Territorial Scale:	All	
	Standards or references:	Sustainable Tourism Plan	
E.3.16			
E.3.16		Sustainable tourism	
	Intent:	To improve the sustainable management of touristic destinations. To measure sustainability management processes in the touristic sector. To monitor the performance and progress over time	
	Indicator:	Tourism enterprises/establishments using a voluntary certification/labelling for environmental /quality/sustainability and/or Corporate Social Responsibility	
	Unit of measure:	%	
	Information sources:	Calculated data	
	Assessment method:	$\frac{\text{Number of tourism enterprises using certification}}{\text{Total number of tourism enterprises}} * 100$	
	Territorial Scale:	All	
	Standards or references:	European Commission (2017): The European Tourism Indicator System. Available at http://ec.europa.eu/DocsRoom/documents/21749/attachments/1/translations/en/renditions/native (13.07.2017)	

E.3.17	Sustainable tourism	
	Intent:	To improve the sustainable management of touristic destinations helping to measure sustainability management processes and to monitor their performance and progress over time
	Indicator:	Tourism enterprises/establishments using a voluntary certification/labelling for environmental /quality/sustainability and/or Corporate Social Responsibility
	Unit of measure:	%
	Information sources:	Municipal and Regional data base
	Assessment method:	Calculate the number of tourism enterprises using a voluntary certification for the environmental quality over the total number of tourism enterprises in the area. Only companies that offer overnight accommodation are to be considered (tourist companies in the strict sense)
	Territorial Scale:	All
	Standards or references:	Certification Organisations + local standards
E.3.18	Occupation rate of tourist accommodation facilities	
	Intent:	Measure the efficiency of the tourism sector
	Indicator:	Occupation rate of tourist accommodation facilities
	Unit of measure:	%
	Information sources:	Municipal and Regional data base
	Assessment method:	Total Overnight stays / (total number of beds in touristic accommodations * 365)
	Territorial Scale:	All
	Standards or references:	Regione Veneto, Direzione Turismo
E.3.19	Average stay of tourists during summer season	
	Intent:	To develop a sustainable tourism
	Indicator:	Average stay of tourists in the territory during summer
	Unit of measure:	number of nights
	Information sources:	Monitored and calculated data
	Assessment method:	Calculation of the average stay during summer season
	Territorial Scale:	
	Standards or references:	

E.3.20	Average stay of tourists during winter season	
	Intent:	To develop a sustainable tourism
	Indicator:	Average stay of tourists in the territory during winter
	Unit of measure:	number of nights
	Information sources:	Monitored and calculated data
	Assessment method:	Calculation of the average stay during winter season
	Territorial Scale:	
	Standards or references:	

E4		AGRICULTURE	
E.4.1	Relevance of intensive agriculture		
	Intent:	To measure the relevance of intensive agriculture	
	Indicator:	Number of agricultural operations	
	Unit of measure:	Number; Number/ha	
	Information sources:	Statistic data	
	Assessment method:	Option 1: Calculate the number of agricultural operations Option 2: Calculate the number of agricultural operations over the local reference area	
	Territorial Scale:	All	
	Standards or references:	Bayerische Verwaltung für Ländliche Entwicklung - Vitalitäts-Check 2.0 zur Innenentwicklung für Dörfer und Gemeinden Leitfadens	
E.4.2	Organic farming		
	Intent:	To measure the relevance of the traditional agriculture	
	Indicator:	Share of area for organic farming	
	Unit of measure:	%	
	Information sources:	Statistic data	
	Assessment method:	$\frac{\text{Cultivation area under organic farming [km}^2\text{]}}{\text{Total cultivation area [km}^2\text{]}} * 100$	
	Territorial Scale:	All	
	Standards or references:	Bayerische Verwaltung für ländliche Entwicklung (2016): Vitalitäts-Check 2.1. Das Analyseinstrument zur Innenentwicklung für Dörfer und Gemeinden. Available at http://www.stmelf.bayern.de/landentwicklung/dokumentationen/059178/index.php?layer=rss (13.07.2017). Eurostat (2016): Sustainable development in the European Union. A statistical glance from the viewpoint of the UN sustainable development goals. 2016 edition. Luxembourg	
E.4.3	Economic relevance of agriculture		
	Intent:	To measure the economic relevance of agriculture	
	Indicator:	Agricultural employed	
	Unit of measure:	%	
	Information sources:	Measured data	
	Assessment method:	Calculate the percentage of agricultural employed on total employed $(\sum \text{people working in the agriculture} / \text{total employed}) * 100$	
	Territorial Scale:	All	
	Standards or references:	Bayerische Verwaltung für Ländliche Entwicklung - Vitalitäts-Check 2.0 zur Innenentwicklung für Dörfer und Gemeinden Leitfadens	

E.4.4	Agricultural population	
	Intent:	To maintain agriculture on the territory
	Indicator:	Evolution of the number of farmers
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	$(\text{value of the year} - \text{value of years before}) / (\text{value of the year}) * 100$
	Territorial Scale:	All
	Standards or references:	Agreste document, Official registration data of farmers from the State Department (DRAAF in France)
E.4.5	Circular economy and short food systems	
	Intent:	To support local agriculture
	Indicator:	Number of short food systems projects, sales (volume) of short food systems
	Unit of measure:	Number; kg/year
	Information sources:	Calculated data
	Assessment method:	Option 1: Calculate the number of short food systems projects Option 2: Calculate the volume of short food systems over the year
	Territorial Scale:	All
	Standards or references:	Statistic data State Department for agriculture and forestry (DRAAF in France), on "Short food systems", "direct sale from the farm", "Maison de pays"
E.4.6	Agricultural autonomy potential	
	Intent:	To maintain agriculture on the territory
	Indicator:	Agricultural area per inhabitant
	Unit of measure:	ha/inhabitant
	Information sources:	Calculated data
	Assessment method:	Calculate the area dedicated to agriculture/inhabitant
	Territorial Scale:	Small to medium
	Standards or references:	Official registration data of farmers from the State Department (DRAAF in France) and general census provided by national institute for statistic (INSEE)

E.4.7	Field (arable) share of agriculture area	
	Intent:	To monitor the share of the field (arable) agriculture area
	Indicator:	Area of field over the total
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	Calculate the area of field (arable) agriculture area divided by total (field and grassland) agriculture area, using statistic agriculture
	Territorial Scale:	All
	Standards or references:	https://www.vorarlberg.at/pdf/agrarstrukturhebung2014.pdf
E.4.8	Certified agricultural products	
	Intent:	Production of agricultural products of quality
	Indicator:	Number of agricultural products of quality
	Unit of measure:	Number
	Information sources:	Calculated data
	Assessment method:	It considers: Protected Designation of Origin (PDO), Protected Geographical Indication (PGI), Quality Wine Produced in a Specified Region (QWPSR), Traditional Speciality Guaranteed (TSG), etc
	Territorial Scale:	All
	Standards or references:	Regione Lombardia, DG Agriculture, Ministry of agriculture
E.4.9	Food self-sufficiency	
	Intent:	To determine how much food is being produced regionally / consumed that is regionally produced
	Indicator:	Consumption of locally produced food
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	Calculate the amount of food consumption of the residents (from consumer-statistic or calculations) related to the production of agriculture from agriculture statistics
	Territorial Scale:	Large
	Standards or references:	http://www.fao.org/3/a-i5222e.pdf Consumer-statistics, Agriculture production statistics

E.4.10	Genetic diversity in agriculture	
	Intent:	To preserve the ecosystem
	Indicator:	Proportion of local endangered breeds
	Unit of measure:	%
	Information sources:	Measured data
	Assessment method:	Calculate the proportion of local endangered breeds (Horse, cattle, pig, sheep and goat)
	Territorial Scale:	All
	Standards or references:	BMUB - Indikatorenbericht biologische Vielfalt 201, 4Nationwide Red Lists, Nature conservation associations
E.4.11	Biologically cultivated area	
	Intent:	Increase biologically cultivated area
	Indicator:	Proportion of biologically cultivated areas
	Unit of measure:	%
	Information sources:	Calculated data
	Assessment method:	Calculate the area of biologically cultivations (near-natural habitats, meadows, scattered areas and hedges with herbaceous trees) over the total land area
	Territorial Scale:	All
	Standards or references:	Data provided Amt für Umwelt, Landesverwaltung Liechtenstein, Umweltindikatoren 2014 - Umweltstatistik 2014
E.4.12	Use of pesticides	
	Intent:	To promote a sustainable Agriculture
	Indicator:	Amount of pesticides used per agricultural area
	Unit of measure:	Kg/hectar
	Information sources:	Statistical data
	Assessment method:	Calculate the ratio between kg of pesticides and Useful Agricultural Area (UAA)
	Territorial Scale:	Large
	Standards or references:	State of Environment Report and Environmental Indicators - ARPA Piemonte: http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/uso-delle-risorse/agricoltura_utilizzo-prodotti-fitosanitari Directive 94/411/CE; EU-COM (2002) 179, EU-COM (2002)349, Dec. 2004/259/EU, Directive 128/2009/EU

E.4.13	Use of fertilizers	
	Intent:	To promote a sustainable Agriculture
	Indicator:	Amount of fertilizers used per agricultural area
	Unit of measure:	Kg/hectar
	Information sources:	Statistical data
	Assessment method:	Calculate the ratio between kg of fertilizers and Useful Agricultural Area (UAA)
	Territorial Scale:	Large
	Standards or references:	State of Environment Report and Environmental Indicators - ARPA Piemonte: http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/uso-delle-risorse/agricoltura_utilizzo-prodotti-fertilizzanti Nitrates Directive 91/676/EU; EU-COM (2002)179, Reg. EU 2003/03

E5		INDUSTRY	
E.5.1	Area for industry		
	Intent:	To measure the correlation between space usages	
	Indicator:	Percentage of area for industry	
	Unit of measure:	%	
	Information sources:	Measured data	
	Assessment method:	Calculate the percentage of area for industry	
	Territorial Scale:	All	
	Standards or references:	Land development plan, municipality's maps	
E.5.2	Industrial Local Units		
	Intent:	To improve local industrial economy	
	Indicator:	Density of industrial activities in the territory	
	Unit of measure:	Number/Km2	
	Information sources:	Statistical data provided by Regional Institution	
	Assessment method:	Verification of the number of industrial activities. Verification of the territorial area (km2). Calculation of the ratio between the number of industrial activities and the territorial area	
	Territorial Scale:	Large	
	Standards or references:	State of Environment Report and Environmental Indicators - ARPA Piemonte: http://www.arpa.piemonte.gov.it/reporting/indicatori-on_line/uso-delle-risorse/industria_unita-locali	
E.5.3	Efficient use of the industrial areas		
	Intent:	To measure the efficient use of the industrial areas	
	Indicator:	Degree of use of industrial territorial infrastructure	
	Unit of measure:	%	
	Information sources:	Calculated data by public authorities with specific competence	
	Assessment method:	Square meters of industrial areas actually occupied (not only available or abandoned etc.) related to the total square meters of industrial areas identified by the territorial plan	
	Territorial Scale:	All	
	Standards or references:	National rules on land use planning	

E.5.4	Economic relevance of industry	
	Intent:	To measure the economic relevance of industry
	Indicator:	Industrial employed
	Unit of measure:	%
	Information sources:	Measured data
	Assessment method:	Calculate the industrial employed on the total (Σ people working in the industry / total employed) * 100
	Territorial Scale:	All
	Standards or references:	Data provided by ISTAT, National Institute for Statistics
E.5.5	Resource productivity	
	Intent:	To promote sustainable production to allow economies to grow while reducing their ecological footprints
	Indicator:	Amount of GDP generated by each kg of material consumed
	Unit of measure:	€ / kg
	Information sources:	Statistical data
	Assessment method:	<p>The indicator relates what an economy produces in terms of gross domestic product (GDP) to the materials it uses based on its domestic material consumption (DMC).</p> <p>It is expressed by the amount of GDP generated per unit of material consumed in the geographical area, i.e. GDP/DMC in EUR per kg. The indicator 'domestic material consumption' (DMC) is based on the Economy-wide Material Flow Accounts (EWMFA).</p> <p>The theory of EW-MFA includes compilations of the overall material inputs into the geographical area, the changes of material stock within the economy and the material outputs to other economies or to the environment. EW-MFA covers all solid, gaseous, and liquid materials, except water and air. Water included in products is included.</p>
	Territorial Scale:	Large
	Standards or references:	EUROSTAT (online data code: tsdpc100) http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tsdpc100&plugin=1

E6		TRADE COMMERCE	
E.6.1	Import/export of food products and beverages		
	Intent:	Promote the internationalization, productivity and development	
	Indicator:	Trade of food products and beverages	
	Unit of measure:	%	
	Information sources:	Measured data	
	Assessment method:	Total import of food products and beverages compared to the export of them	
	Territorial Scale:	All	
	Standards or references:	Data provided by ISTAT, National Institute for Statistics	
E.6.2	Settlements without grocery stores		
	Intent:	To reduce the number of settlements without grocery stores	
	Indicator:	Number of settlements without grocery stores	
	Unit of measure:	%	
	Information sources:	Calculated data	
	Assessment method:	Calculate the ratio between the number of settlements without grocery stores and the total number of settlements (little, medium and large grocery stores)	
	Territorial Scale:	All	
	Standards or references:	Open Data Lombardia, Regione Lombardia - DG economical development, commerce association	